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PSYCHOLOGICAL STUDIES OF KORSAKOFF'S PSYCHOSIS: II. PERCEPTUAL FUNCTIONS[1]

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Korsakoff's psychosis poses serious theoretical questions to psychologists. The most remarkable fact about this syndrome that has come to light thus far has been the patient's virtual inability to remember events and experiences which occurred since the onset of the disease and for some time previously. In contrast, other aspects of cognitive functioning appear to be relatively unimpaired. Recall of long past events, problem solving and reasoning dependent on o'd learning, social behavior and the discharge of routine activities such as eating or dressing, are carried out with customary facility.

Most students of this psychosis have argued that a mere disorder in retentive memory cannot adequately account for its symptoms. They first (3, 11) sought the primary defect in the process of registering new experiences, but doing this they made an inference from the observed deficit rather than defined it in terms of specific mental operations. Subsequently more stress was laid on attitudinal factors, particularly by students of thought processes in Korsakoff's psychosis (22, 12, 23), and more recently several observers have proceeded from an interest in attitude and attention to examining how patients with this disease organize their sensory impressions and experiences (5, 9, 7). The suggestion that an attitudinal disturbance represents the primary psychological defect in Korsakoff's psychosis, and in turn accounts for the inadequate structuring, selection and integration of newly presented material, is of considerable theoretical significance, for it could be tested by relatively simple perceptual performances in the experimental laboratory and, possibly, also by clinical observation. Gruenthal and Stoerring (13), and Conrad (8) in reporting on two patients with an extreme memory defect, disputed or minimized the presence of perceptual defects in their patients. Yet experimental studies (6, 2) of perception in Korsakoff's psychosis have demonstrated abnormalities which support the hypothesis of an attitudinal defect or disturbance of perceptual organization.

The purpose of the present study was to investigate the performances of patients with Korsakoff's psychosis in a wide range of perceptual tasks which depend on the function of several sense modalities at different levels of complexity, but require rela-

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tively little motor skill. Four principal areas of perceptual functioning were examined: (a) span of perception; (b) completion, integration of fragments into perceptual wholes; (c) comparison and discrimination of distances in space and time, and of figures; (d) the effect of mental set or attitude on perception, the patient's dependence on expectancy and his readiness to change it.

THE PLAN OF THE RESEARCH

SUBJECTS

The experimental sample for this research consisted of 24 patients of the Boston State Hospital, eight men and sixteen women, who had been hospitalized for periods ranging from 12 months to 12 years. They were all diagnosed by the neurologist members of our research team as having Korsakoff's psychosis (31), and were in the chronic phase of the disease. Several of the patients had been under observation from the onset of the psychosis, and were known to have had the acute neurological and psychological symptoms of Wernicke's encephalopathy. In age they were between 31 and 74 years (mean = 53.3, SD = 9.3), and in Intelligence Quotient they ranged from 84 to 114 (mean = 103.4, SD = 8.9), as measured by three verbal sub-tests of the Wechsler-Bellevue Scale (33); comprehension, vocabulary, similarities, which closely approximated their full scale IQ (31). These 24 patients, all of whom had a history of alcoholism, formed about three fifths of a larger sample with similar records, from which they were selected on the ground of showing the least derangement in their cognitive functioning. The remainder were too severely deteriorated to follow the instructions of the experimental procedure, and their impairment was too general to be instructive for studying the very specific psychological disturbance characteristic of Korsakoff's psychosis. The experimental samples for the individual perceptual experiments varied between 19 and 24 subjects drawn from this sample.

Control samples were recruited from two sources. The first, control group I, consisted of out-patients who were receiving psychotherapy in the Alcoholic Clinic of the Massachusetts General Hospital. This group was composed of 16 men and eight women who shared with the Korsakoff patients a history of alcoholism, and like them had no alcohol in their system at the time of testing, since complete abstention was a requisite for treatment in the clinic. None of these patients was known to suffer from a neurological or other medical disease. The second control sample was obtained from a group of neurological patients who were receiving physiotherapy on the wards of the Lemuel Shattuck Hospital. This sample, control group II, consisted of four men and four women who had been hospitalized for six months or longer. They were chosen for sharing with the experimental group the experience of prolonged hospitalization. They had no record of alcoholism and no clinical sign of cerebral disease other than that related to the normal aging process.

According to the design of the study control and experimental samples were to be matched for age and IQ. For this reason only patients above the age of 35 were selected for the control groups; with means of 48.3 (SD = 10.4) and 49.0 (SD = 8.7) they did not significantly differ in age from the Korsakoff group (t = 1.68 and 1.08, both $p > .05$). In respect of IQ, however, only control group II was completely matched with its mean score of 103.5 (SD = 9.8). Control group I had a significantly higher (t = 3.87) mean score, 114.0 (SD = 12.8). This difference could not be successfully narrowed even if an arbitrary restriction had been imposed on the selection of control subjects. Neither could such a policy be entirely justified, since the discrepancy observed reflects the intellectual deterioration caused by the neurological disease rather than basically different abilities (31).

Not all control subjects were available for every testing procedure reported on in

this paper which, together with other experiments in our research, demanded as many as ten to twelve sessions in the laboratory. The control samples for the various perceptual experiments consisted of 14 to 20 alcoholic outpatients and 6 to 8 neurological inpatients.

TESTING CONDITIONS AND METHODS

A few tests, *e.g.* the Wechsler-Bellevue, were carried out at the hospitals in which the patients forming the experimental group and control group II were being treated. The bulk of the experimental work, however, was conducted at the psychological laboratory of the Massachusetts General Hospital where hospitalized patients were taken by taxi on repeated occasions.

The perceptual experiments reported in this paper formed part of a wider experimental design. In addition to testing procedures specially designed or adapted for the purpose of this research, all Korsakoff patients were submitted to the entire Wechsler-Bellevue Intelligence Scale (33) and to Halstead's Battery of Neuropsychological Tests (14). The various testing methods used in the study of perceptual functioning will be discussed in detail in the following section under the four class headings as stated above. Each procedure will be followed by a report of the experimental results, more particularly the mean scores obtained by the three groups of subjects. Significance of differences was tested by t ratio where applicable; in the absence of homogeneity of variances the statistical procedure used was Mosteller and Bush's (20) version of the Mann-Whitney test, which gives z scores. In reporting results on specific tests, those of control group I will always be listed before control group II.

METHODS AND RESULTS

SPAN OF PERCEPTION

Reporting their findings on the performance of Korsakoff patients on the digit span test, both Wechsler (32) and Zangwill (34) remarked that the task of repeating a series of digits immediately after hearing them poses no particular difficulty to these subjects. Our Korsakoff group confirmed these observations, for their mean weighted score on the Wechsler-Bellevue digit span subtest was 7.4, which is well within the normal range for their age group. However, if their task involves some effort in perception even their immediate recall shows some deficiency. This became evident when they were asked to repeat sentences which on one occasion were presented vocally on a tape, on another occasion visually in a tachistoscope. Of 21 Korsakoff patients 18 reproduced the six test sentences without error after auditory presentation, and the mistakes of the others were negligible in number and severity. Reproduction of complete sentences after visual presentation was considerably less successful.

Tachistoscopic presentation of sentences. Six sentences ranging in length from three words (5 syllables) to twelve words (18 syllables) were presented in a standardized order on a Gerbrands tachistoscope which provides for constant illumination. The words were printed in type of one in. height, and the field of vision was 7¾ x 7¾ in. at a distance of about 24 in. from the subject's eyes. His task was to read these sentences, each of which was exposed for one or several successive periods of one sec., until faultless reproduction was achieved. The subject's instruction was to read as much as he could on each exposure, so that with the longer items completion of the task tended to be by instalments. If this was the case, after reading the last fragment the subject was asked to repeat the entire sentence. It was in their frequent failure to reproduce whole sentences that our 20 Korsakoff patients tested differed most consistently from both control groups. In the number of exposures required for completing the correct reading of the six sentences they differed significantly ($z = 2.72$, $p < .01$)

from the 15 subjects of control group I, with means of 13.9 as against 10.6. The mean number of presentations needed by the six members of control group II, however, was 13.5 and not significantly lower. While all but two of the control subjects, one from each group, could reproduce each of the six test sentences in full after reading it in instalments, none of the Korsakoff patients could do this. In fact, on several occasions they needed as many more presentations to achieve this criterion than they required for its first piecemeal perception. Furthermore, the larger number of exposures they needed for completing the first, the more additional presentations did they tend to require before they could meet the second criterion ($r = .54$, $p < .01$).

Tachistoscopic presentation of words. The same procedure was followed as in the previous experiment, except that each card contained a single word. Altogether nine words were used, seven with a frequency count (28) of six and two with a frequency count of twelve; the former ranged in length from four to ten letters, increasing by intervals of one, and the latter included one word of four and one of five letters. Each subject's threshold was established by means of a pilot test, starting with an exposure of .01 sec. and increasing it by steps of .01 sec. The test cards were then presented in a standardized order. In case of failure subsequent presentations followed after some delay, the exposure time being increased by .05 sec. Individual scores consist of the total time required for correct reproduction of the nine test words. With a mean score of .29 control group I (N = 16) needed a significantly shorter exposure time ($z = 2.72$, $p < .01$) than the Korsakoff group (N = 20) whose mean score of 1.60, however, was lower, though not significantly so, than the corresponding mean of 2.16 in control group II (N = 6).

Tachistoscopic presentation of pictures. A card with pictures of ten objects was shown in the same way as the words. The pictures represented such common objects as a chair, a fish, a violin, etc. some drawn in black and others in colored ink, each 1½ to 2½ in. in its longest dimension and spaced at even distances on a white ground of 7¾ x 7¾ in. Each subject's threshold was first determined by his correct recognition of two figures presented singly, beginning with an exposure time of .01 sec. and increasing it by steps of .01 sec. The test card was then shown at threshold level of exposure and, unless this was above the following, successively with exposures of .1, .25, .5 and 1.0 sec. The subject's instruction was to report as many of the objects as he could see each time. Means of items correctly recognized at each exposure, and mean increment with increasing exposure time are given in Tables 1 and 2. Two incidental observations are of interest. While several Korsakoff patients, like most members of both control groups, spontaneously remarked on the colors (two objects were in red, one each in blue and green), six subjects of the experimental group, none of whom was color blind, reported on questioning that all the drawings were in black and white. This finding assumes statistical significance only if we compare the experimental group with the combined control groups, in neither of which did a subject fail to notice colors (*chi sq.* = 5.25, $p < .05$). The other observation concerns a tendency to generalize to a class from a single object. On their first encounter with the test card ten Korsakoff patients reported to have seen fishes or pots and pans or musical instruments, and altogether 16 members of the experimental group responded with an incorrect generalization at some stage of the experiment. This compares with one instance in each of the control groups on first presentation, and a total of one in control group I and two in control group II. With *chi sq.* = 6.40 ($p < .05$) and 15.7 ($p < .001$) the differences are significant between the Korsakoff group and control group I.

The conclusions to be drawn from these

TABLE 1

Mean Recognition of 10 Pictures Simultaneously Presented

	Exp. Group		Contr. I		Contr. II		*t* ratio	
	N	Mean	N	Mean	N	Mean	Exp.-Contr. I	Exp.-Contr. II
S's own threshold	22	.68	15	1.80	6	1.33	4.93**	2.08**
.1 second	19	1.10	15	2.00	5	1.60	3.72**	1.25
.25 second	21	1.22	15	2.80	6	1.83	6.96**	2.49*
.50 second	22	1.59	15	3.60	6	3.17	8.93**	6.58**
1.0 second	22	2.27	15	4.80	6	4.00	7.77**	4.12**

** $p < .01$; * $p < .05$

TABLE 2

Mean Increment of Objects Recognized with Increasing Exposure Time

	Exp. Group	Contr. I	Contr. II	*t* ratio	
				Exp.-Contr. I	Exp.-Contr. II
.10-.25 second	.11	.80	.40	5.31**	1.45
.25-.50 second	.38	.80	1.33	2.26*	3.28**
.50-1.0 second	.68	1.20	.83	2.17*	.41
Threshold-1.0 sec.	1.59	3.00	2.67	4.15**	2.10*

** $p < .01$; * $p < .05$

three experiments are somewhat ambiguous. As compared with the non-hospitalized control group the span of perception of our Korsakoff patients is consistently narrower; in comparison with the hospitalized controls, however, it is not. Since the latter were chosen to control for the effects of prolonged hospitalization, it is at least possible that lack of practice or reading without pressure of time may account for the results of the two experiments with verbal material. The picture test confirms the finding that at relatively short exposures the two hospitalized groups do not significantly differ in their span of perception. However, as soon as the special difficulties raised by very brief exposure were eliminated, both control groups increased their span and gained with progressively longer exposures significantly more than the experimental group. One explanation of this finding is that Korsakoff patients show a deficit not so much in their initial or immediate grasp of the material presented to them as in their capacity to shift their attention from one discrete item to another. The argument that they report fewer items because, after perceiving, they are unable to recall them all, can be ruled out since the immediate reproduction of a list of four or five items is well within the capacity of these patients.

COMPLETION, INTEGRATION OF FRAGMENTS INTO PERCEPTUAL WHOLES

The span of perception experiments discussed would allow for a tentative conclusion that Korsakoff patients show characteristic defects in the sequential integration of partial information forming a whole, such as fragments of sentences, and in their grasp of simultaneously presented unrelated information. An experiment with apparent movement (26) which demonstrated the Korsakoff patients' frequent failure to perceive the illusion of motion, particularly if the material did not itself suggest its occurrence, supports the argument for their deficiency in sequential integration. The question then arises whether Korsakoff patients show a deficit in the cognitive integration of parts into wholes of all kinds. Buerger-Prinz and Kaila (6) attributed to them this defect which, they thought, resulted from a failure to adopt an orientation towards the whole rather than its constituent parts. By implication this defect would also mean a relative inability to elaborate cues, as we do when we read and reconstruct

words from a few characteristic details. The following three experiments were included in the study to investigate perceptual completion or integration in Korsakoff's psychosis.

Mutilated word test. A series of words printed in large, clearly readable type was presented by means of the tachistoscope, with successively longer exposure as required. Some of the words were incomplete, either their first, last, or one or two middle letters being deleted, but always so that the remaining letters were sufficient to reconstruct one and only one meaningful word.

FIG. 1. Twelve cards taken from Street's Completion Tests (25)

e.g. SW ET. The test material also included several control words printed in full, some of which appeared in the usual upright horizontal position, others sloping up or down, or upside down. It was found that for the Korsakoff group the percentage of correct responses or speed of recognition of the mutilated words was not lower than for the control words in the familiar or disoriented position, except in two instances in which the entire upper or lower half was missing, and in SAMPLE from which the letter P had been omitted. This last word furnishes the only instance of the Korsakoff group's performing less efficiently than the controls, and that happened presumably because most of its members appeared to be entirely satisfied with the recognition of SAM LE as the name of a Chinese. The evidence of this experiment argues against the Korsakoff patients' relative inability to elaborate cues or integrate fragments into wholes.

Street completion cards. The hypothesis under review was further tested by using non-verbal visual material, twelve cards from Street's Completion Tests (25) shown in Figure 1. These pictures printed on cards 6 x 6 in. were shown in order from 1 to 12 in the upright position, but without the serial number. The task was to recognize the object they presented (a dog, a cat, etc.), each card being shown for a maximum of four min., during which the subject held it in his hand and could turn it around if he wished to. As soon as he gave the correct answer he was shown the next card; if he gave an incorrect response he was told so and asked to try again. Frequencies of correct recognition of each card are listed in Table 3; experimental and control groups, however, were compared on mean individual scores. These were computed by weighting correct responses according to their difficulty, as indicated by a pilot study with normal controls. Cards 1 to 6 each gave two, card 7 three, cards 8 and 9 six, cards 10 to 12 twelve points. Mean scores were 15.8, for the Korsakoff, 21.1 and 22.3 for the two control groups; t ratios of 1.77 and 1.86 were not significant at the .05 level. Time was not scored, but it was observed that Korsakoff patients tended to respond more readily, though often incorrectly, to the difficult pictures, and therefore needed more occasions to correct their mistakes in order to complete the task. They were also more prone to pick out a detail and, if asked to make another effort, to add yet another detail rather than take in the whole. Since they made more mistakes, the incidence of their attempts to correct these was also higher, but after an initial error their scores of success were fewer than those of the control subjects.

Test of tactual completion. In order to test the capacity of perceptual integration in another sense modality, blindfolded subjects were presented with square boxes of 3½ x 3½ in. and one in. high, on top of which a letter, a number, or a short word was outlined with pinheads (hatpins with rather large spherical heads were used) or in an elevated ridge of baked clay. Each of the figures was submitted for tactual recognition in three graded stages of fragmentation, as shown in Figure 2, beginning with the most difficult version. Subjects could use any finger on either hand to palpate the test object, and each exposure was limited to 90 sec. If the more fragmented version of a figure was accurately identified, its fuller variants were omitted from the test. The number of correct solutions on the first, second or third model of each figure are listed in Table 4. Assigning scores of three, two, and one for success on the models in

TABLE 3

Street Completion Cards: Number of Correct Recognitions

Cards	1	2	3	4	5	6	7	8	9	10	11	12
Korsakoff (N = 22)	20	22	22	20	19	18	10	4	4	3	1	0
Control I (N = 16)	15	16	16	16	14	14	10	6	5	2	1	2
Control II (N = 8)	6	6	6	6	6	4	4	2	1	2	1	0

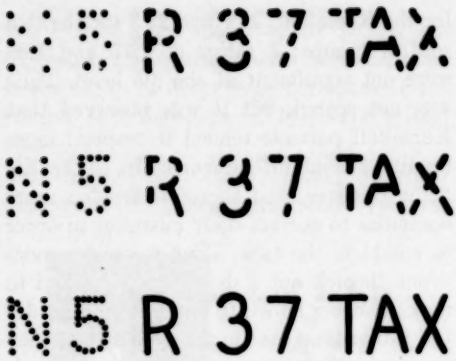

FIG. 2. Fragmented tactile figures

order of diminishing difficulty, the Korsakoff group with a mean score of 7.4 did not differ significantly from either control group which had mean scores of 8.1 and 7.5 (t = .59 and .06). Assigning the appropriate number of points for correct recognition of single letters or digits rather than complete items (37 and TAX) did not make for significant differences, neither did *chi square* tests on frequencies of success for any of the five figures.

TESTS OF COMPARISON AND DISCRIMINATION

The foregoing findings demonstrated that the Korsakoff patient's perceptual disturbance is not primarily in the process of utilizing cues for the patterning of fragments into complete figures. However, these tests did not depend on accurate perception of scale or of the proportion of parts to the whole. The Korsakoff patient's relative acuity in judging identity or proportion on basic perceptual dimensions, and in discriminating between more complex patterns was tested by experiments described in this section.

Visual judgment of length. The purpose of this experiment was to test the capacity to estimate and compare distances along a single spatial dimension, *i.e.* length. It can also be viewed as a performance test in arithmetic. The material consisted of twelve flat bars of wood 1 in. wide, ¼ in. thick, and of varying length, two each being 3, 5, and 9 in., one each 4, 6, 12, 15, 18, and 24 in. long. In one test the subject's task was simply to determine identity of length, in a second test he was given three tasks of relational comparison. The bars were spread out in randomized order and at various angles on a flat surface in front of the subject who had to point to those which represented his response, but was not allowed to lift them up or to push one alongside another for comparison.

In the first task the subject was asked to point out which of the bars was identical with the one indicated by the experimenter who presented six in the following order according to length: 5, 9, 6, 3, 12, 4 in. Three of these could be matched exactly, another three could not. All but four members of the Korsakoff group performed this task without error; two made one mistake each when correct matching was possible, another two made one and two mistakes respectively when exact matching was not possible. These few errors hardly alter the conclusion that our Korsakoff patients were fully capable of this simple matching task.

The other three tasks probed relational judgment. First the subjects were presented with the four longest bars, altogether twelve times in randomized order, and were asked to point at that one of the shorter pieces

TABLE 4

Tactual Recognition: Number of Correct Response with Diminishing Fragmentation

Figure	N			5			R			37			TAX		
Model	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Korsakoff (N = 21)	3	8	7	2	9	8	9	2	9	6	2	1	2	0	6
Control I (N = 16)	6	7	3	4	7	4	9	4	3	7	2	6	1	2	9
Control II (N = 4)	2	0	2	2	0	1	0	3	1	1	2	1	0	1	1

which measured ½, ¼, ⅙, ⅛ of the longest, ½, ⅓ and ⅙ of the second, ⅓ and ⅕ of the third, ½, ⅓ and ¼ of the fourth in length. The second set of tasks was the reverse of the first; all but the three longest pieces were presented in randomized order with the instruction to single out those which were twice, three times, etc. as long as the object of comparison. Lastly, the subjects were shown two appropriately matched pieces at a time, and their task was to estimate how many times the shorter went into the longer. The combinations were identical with those of the first and second sets, and therefore the correct answer was always an integer. Scoring errors for each subject, the mean of the Korsakoff group was significantly higher than that of either control group on all three tasks, as shown in Table 5. Members of all three groups tended to overestimate the longer of two bars, and in the first two series few errors were wider of the mark than one place, *i.e.* the next longer or shorter piece was chosen instead of the correct one.

Tactual-kinesthetic judgment of width. A measure of tactual-kinesthetic judgment of width was obtained in an experiment designed to explore the extent of "figural after-effect" which, according to the evidence of Klein and Krech (16) would have been expected to be more pronounced in the Korsakoff patients than in the controls who had no clinically diagnosed brain injury.[3] The test material was modelled on that used by the authors quoted. It consisted of a test object constructed of wood 1½ in. wide and a comparison gauge tapering from 4 to ¾ in., both mounted on stands 4 in. high, with riders sliding above the top, so as to allow contact of only the tips of thumb and forefinger with the sides of the objects. The first task of the blindfolded subject was to mark the position on the comparison gauge where this was as wide as the test object. This he did twice in succession with his dominant hand, first starting from the wide end of the scale, secondly from the narrow end. Twenty of the 22 experimental subjects and 15 of the 24 controls repeated the experiment under identical conditions after the elapse of two or more weeks. Thus three measures of tactile judgment were obtained: (a) accuracy of judgment, *i.e.* deviation from the correct position of 1½ in. on the comparison gauge; (b) consistency of judgment, *i.e.* difference between position marked in descending and ascending approach to correct position on the scale; (c) discrepancy between judgment on first and second test. Scores for (a) and (c) were based on arithmetic means of descending and ascending judgments, and were measured in the unit of the gauge: $\frac{1}{24}$ in. The results are presented in Table 6, and show no significant difference between the Korsakoff patients and either control group.

TABLE 5

Visual Judgment of Length: Mean Error Score

	Korsakoff N = 20	Control I N = 20	Control II N = 8	*t* ratio	
				Kors.-Contr. I	Kors.-Contr. II
Series I	7.20	2.95	2.8	4.52**	5.36**
Series II	7.20	3.10	3.8	4.78**	4.05**
Series III	6.50	3.30	2.9	3.15**	3.04**

** $p < .01$

Judgment of time. Judgment of short durations and intervals of time was tested by immediate reproduction. The experimenter operated a buzzer which could also be activated by the subject from the other end of the laboratory, by pressing a telegraph key. The key started an electric clock which stopped instantly on its release, or, if so set, on second pressing down. The test consisted of four series of tasks: (a) tests of matching duration of time, in which the buzzer sounded without interruption over periods of 5, 15, 30, 2, 7,

[3] The experiment modelled on Klein and Krech's procedure actually resulted in differences between experimental and control groups opposite in direction to the prediction.

TABLE 6

Tactual-Kinesthetic Judgment of Width: Mean Error in 1/24 in.

	Korsakoff		Control I		Control II		*t* ratio (*z* score)	
	N	Mean	N	Mean	N	Mean	Kors.-Contr. I	Kors.-Contr. II
Error of Judgment	22	10.1	18	8.2	6	19.5	.78	1.85
Margin of Consistency	22	5.9	18	5.4	6	4.3	.27	*z* = .59
Retest Discrepancy	20	8.0	11	6.9	4	1.6	.42	1.16

TABLE 7

Time Judgment: Mean Error Score (Ratio of Discrepancy to Standard)

Standard: seconds	5	15	30	2	7	10	ALL	15	2	10	30	5	7	ALL
Task	Match							1/3	3x	½	½	2x	2x	
	Duration													
Korsakoff (N = 20)	37.5	34.3	38.6	28.8	25.8	21.2	185.6	26.4	25.8	17.6	15.0	13.5	21.0	126.0
Control I (N = 16)	20.6	17.7	15.2	12.5	12.1	9.1	87.8	7.5	15.6	5.3	13.1	9.7	10.9	62.1
Control II (N = 6)	10.0	7.3	9.8	16.7	10.5	10.0	64.3	30.0	10.8	3.5	12.7	5.0	16.3	78.4
	Interval													
Korsakoff (N = 20)	27.4	20.0	31.0	27.6	18.6	20.8	145.0	41.6	48.7	32.1	22.8	41.3	32.0	218.2
Control I (N = 16)	19.4	16.4	14.2	21.9	12.2	11.9	95.6	16.9	19.2	10.6	7.4	10.0	6.6	69.5
Control II (N = 6)	16.7	10.5	12.0	8.3	12.8	14.2	74.6	16.7	11.0	16.7	12.8	7.5	7.5	72.1

and 10 sec.; (b) tests of time intervals of the same lengths, which were marked by brief sounding of the buzzer at the start and termination; (c) tests of time duration and (d) of time intervals, in which the subject's task was to reproduce a multiple or a fraction of the length indicated by the experimenter: a third of 15 sec., treble 2 sec., halve 10 and 30 sec., and double 5 and 7 sec. Scores were calculated by taking the ratio of discrepancy to the standard. Mean scores for sub-tests and series are listed in Table 7; significance of differences was tested between experimental and control groups for total score within each of the four sections of tasks. In none were the variances homogeneous; the *z* scores obtained by the Mosteller-Bush test (20) are set out in Table 8. While the errors of the Korsakoff group were consistently larger, in two series of tasks the difference between their accuracy and of control group II was not statistically significant; they were so in all other instances which include the four comparisons with control group I. Testing mean differences between a subject's score on one and either of the other two types of task (duration *vs.* interval and matching *vs.* multiplying and dividing), no significant differences were found between experimental and either control group.

TABLE 8

Time Judgment; Difference Between Mean Rank as Indicated by z Scores Calculated by the Mosteller-Bush Test

	Duration		Interval	
	Match	Multiply & divide	Match	Multiply & divide
Korsakoff-control I	2.93**	2.67**	1.82*	3.54**
Korsakoff-control II	2.58**	.88	1.43	2.80**

** $p < .01$; * $p < .05$

Discrimination of speech and rhythm. Halstead's (14) battery for brain damage

which was administered to the entire experimental sample, also showed that their errors in time judgment exceeded the limit of normal performance. Two other tests of this battery, speech discrimination and Seashore's Rhythm Tests (24) provided further data on the perceptual capacity of our Korsakoff patients. Since these tests have been standardized by Halstead no controls were run on them in the present study. The first test consists of sixty spoken nonsense syllables which are presented on a tape recorder, the subject's task being that of recognizing them by singling out one of four syllables printed on a scoring sheet for each item. Seashore's test requires that the subject decide which of thirty pairs of acoustic rhythmical patterns were identical, which different. Only one of the 19 Korsakoff patients made fewer than the 7 errors which mark Halstead's upper limit for normal performance on the speech test; two others scored within the normal range on the Seashore test. The mean error on the former was 19.4 (SD = 7.8), mean rank score on the latter 8.9 (SD = 2.4).

Identification of visual pattern. Perceptual identification was tested visually by an experiment in which the designs illustrated in Figure 3 were shown serially to the subject who was instructed to signal recognition each time he saw the standard of identification. This figure, shown at the top of the illustration, was presented three times in a series of 27, in positions 9, 16, and 23. The other figures were shown in the order illustrated, each being presented once except for the third which occurred a second time in position 26. It is apparent from the illustration that the test material varied widely between figures that had nothing in common with the standard and others that were of the same general pattern but drawn on a smaller or larger scale, or differing only in the proportion of a detail to the whole. The figures were presented singly by means of a tachistoscope. The exposure time of .5 sec. was not intended to create ambiguity, and could therefore be extended to suit the subject's convenience. In case of doubt a figure was presented a second time. Initially the subject was given a model of the standard on a card, and was told to remember it. He was instructed that he would see a number of figures, one by one for a short time in the apparatus in front of him, "some exactly like the one he was looking at, others similar but not identical in every respect, and still others that are entirely different;" and that his task was to say "yes" each time he would see exactly the same figure, "no" when the figure was not exactly the same in shape or size. He could examine the model for as long as he needed to be certain of recognition, and was subsequently shown the standard once more in the tachistoscope. The card was taken away from the subject before testing. On completion of the 27 presentations and responses, the same task was performed a second time in reverse order; but now the subject was instructed to look at the model on the card before each exposure.

Frequencies of positive responses, both

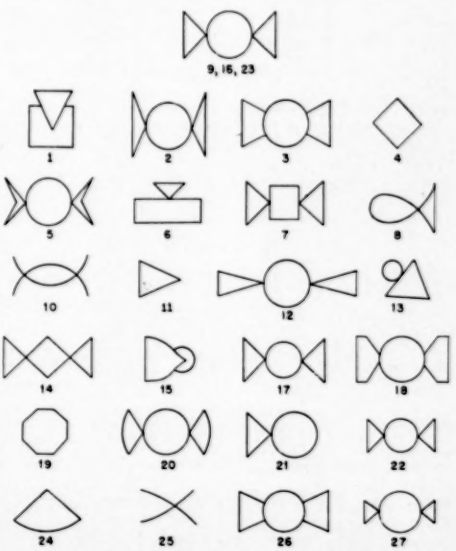

FIG. 3. Designs used in visual discrimination task described in text.

TABLE 9
Identification of Visual Pattern ("Winged" Figure): Frequencies

	Korsakoff (N = 22)		Control I (N = 16)		Control II (N = 8)	
	Forward	Reverse	Forward	Reverse	Forward	Reverse
Correct						
Item 9	19	18	15	16	7	7
16	19	18	15	15	8	7
23	20	18	14	15	6	7
Incorrect						
Item 2	14	5	5	0	3	1
17	20	18	9	7	6	4
22	16	15	6	6	5	5
27	11	16	4	2	5	2
All others	41	35	2	1	3	0

correct and mistaken, are listed in Table 9, which shows that the reduction of the time gap between inspection of the model and testing did not increase the frequency of recognition. Incorrect calls of identification were somewhat fewer in the reverse series, but in none of the groups is the difference statistically significant. Combining all errors by omission as well as by commission, the mean of the Korsakoff group is significantly higher, as shown in Table 10, than the corresponding mean of either control group, both in the forward and in the reverse series.

Identification of auditory pattern. An auditory version of the visual test was designed using nonsense words in place of the complex patterns, dissimilar meaningful words in place of the simple figures. The following list was recorded on a tape: teeron, tron, taron, run, toran, ron, tarat, taren, *taran*, naran, tree, ataran, tanar, turun, toon, *taran*, teren, tarun, river, teran, tor, toron, *taran*, helmet, tarana, taron, turon. The standard word, *taran*, appeared in positions 9, 16, and 23, and the third and 26th items were again the same. The standard word was presented three times in the recorded instructions, and repeated by the experimenter and the subject before the test, which prescribed the same task as the visual experiment.

TABLE 10
Identification of Visual Pattern ("Winged" Figure): Mean Error

	Korsakoff N = 22	Control I N = 16	Control II N = 8	*t* ratio	
				Kors.-Contr. I	Kors.-Contr. II
Forward series	5.0	1.9	2.2	4.07**	2.83**
Reverse series	4.4	1.6	1.9	3.34**	2.25*

** $p < .05$; * $p < .01$.

Twelve of the 21 experimental and all but one of the 24 control subjects, 16 outpatients and 8 hospitalized, correctly identified the standard word in every instance. A majority of the control subjects, as well as of the Korsakoff group, also responded positively to "toran" and "teran". These two items were therefore excluded from the analysis which showed that the Korsakoff group made a mean error of 2.6 as against .75 and 1.0 of the two control groups; *t* ratios were 2.98 ($p < .01$) and 2.18 ($p < .05$).

Both this auditory task and the test of time perception were repeated with the entire Korsakoff group while subjects were blindfolded. Their accurate performance in tactual judgment of width suggested the hypothesis that eliminating sensory stimulation irrelevant to the task, *i.e.*, reducing distraction, might significantly improve their perceptual accuracy. In neither instance was this hypothesis confirmed, for the mean scores were about the same under both experimental conditions; nor did individual subjects tend to perform consistently better under conditions of minimal distraction.

Visual discrimination. The discrimination tasks involved in the previous two experiments were comparatively easy, since only a simple yes-no type of response was required and, except for a few instances, differences either in terms of absolute or relational criteria were gross. Most sub-

jects solved the tasks with few errors or none, and the results indicated a qualitative rather than a scalable gradient of generalization, *e.g.* that differences in proportion are more likely to be missed than those in contour, change of a vowel rather than its omission or the addition of another. To correct for these limitations of the two tests of perceptual identification, another discrimination task was included in the study which increased the difficulty of success both by providing less obvious cues, and by demanding a threefold choice in response, and which moreover allowed for scalable scoring.

The test material consisted of a series of nine closed arches, ranging from a circular or Romanesque type, by degrees of equal appearing intervals, to a sharply arched Gothic window, as illustrated in Figure 4. The subjects were given two tasks: first to recognize the middle item, and second the middle range, *i.e.* items 4, 5, and 6. In both tests the selection was made from series given in 36 consecutive exposures in the tachistoscope, each lasting .5 to .8 sec. to allow adequate time for inspection. On request a second presentation was given. Before each test the subject spent some time inspecting a chart listing models of the nine figures in order of roundedness. His task was to respond to each exposure, either by equating it with the standard or, if it appeared different, stating whether it was more pointed or rounded. In both tests the order of presentation was the same, so that the first and last runs of nine exposures included item 5 three times, items 1 to 3 and 7 to 9 once each; the two intermediate sequences of nine consisted of one exposure of each figure.[4]

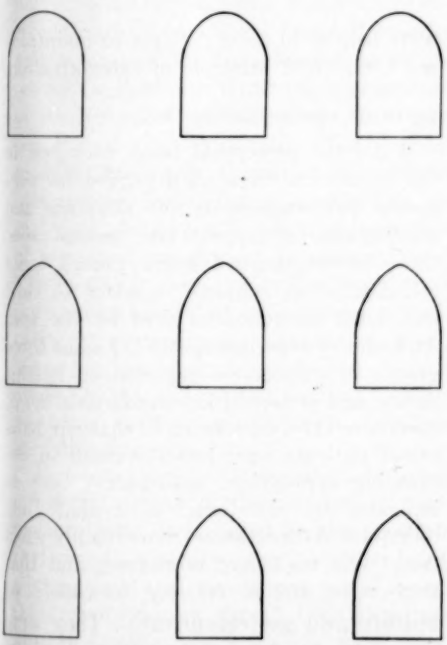

FIG. 4. Graded arch figures used in visual discrimination experiment.

The analysis of the three types of responses was done separately for items 1 to 9 and 28 to 36 of the first test, which represented an actual probability of one in three but subjectively a lower expectancy of the standard's occurrence; for items 10 to 27 on which actual and expected probability were alike one in nine; and for the second test which offered a theoretical as well as an actual probability of one in three throughout. Mean scores as presented in Table 11 show that both control groups made significantly more correct calls in each of the three phases, and also more correct calls of "equal". In this latter respect, however, only control group II showed consistently a statistically significant superiority in accuracy. In all phases of this test the Korsakoff group made significantly more inaccurate equations with the stand-

[4] This as well as the two identification tasks require accurate recognition for successful performance, and therefore may more properly belong to a study of memory than one of perception. However, several experimental findings, some presented in this paper and others under the heading of concept formation, have shown that dependence on immediate recall does not significantly increase the Korsakoff patient's inaccuracy of perceptual discrimination of figures or the looseness of his equation of various designs with a standard.

TABLE 11

Width of Categorization (Arches): Means of Correct and of Positive Calls and Mean Range of Positive Calls

	Occurrence of standard	Kors. N = 19	Control I N = 16	Control II N = 8	*t* ratio (*z* score)	
					Kors.-Control I	Kors.-Control II
Mean correct call						
Test I	1:3	10.3	13.9	15.0	4.00**	4.25**
	1:9	11.7	14.9	15.2	3.23**	3.19**
Test II	1:3	18.7	24.9	25.9	2.84**	2.58*
Mean correct call of equal						
Test I	1:3	2.3	3.2	4.9	1.25	$z = 3.13$**
	1:9	.7	1.1	1.6	3.80**	2.30*
Test II	1:3	6.2	8.4	9.5	1.88	$z = 3.37$**
Mean incorrect call of equal						
Test I	1:3	3.5	.9	1.6	3.58**	$z = 1.58$*
	1:9	4.2	2.0	4.9	2.91**	$z = 1.96$*
Test II	1:3	9.3	2.1	6.8	2.13*	$z = 3.03$**
Range of equal (mean deviation)						
Test I	1:3	1.1	.3	.4	$z = 3.48$**	6.69**
	1:9	1.0	.5	.5	2.13*	2.08*
Test II	1:3	1.3	.4	1.2	1.01	1.27

** $p < .01$; * $p < .05$.

ard than either control group. Their limits of categorization, as measured by mean deviation from the standard, were also consistently wider, though only in Test I significantly more so than those of the two control groups. The relatively narrower range of misidentification shown by the Korsakoff group in Test II raises the question how it happened that they performed more accurately in this inherently more difficult task. In Test I they were required to distinguish three categories: rounder, equal, and more pointed. After a while several Korsakoff patients appeared unable to maintain this threefold division, and proceeded by distinguishing only either rounder or more pointed arches from the standard, but not both. In Test II the model they followed was a chart on which the standard occupied the middle row of three figures, the top row the three rounder, and the bottom row the three more pointed arches. Quite possibly this model proved more helpful to these patients in maintaining a threefold principle of categorization.

TESTS OF PERCEPTUAL SETS

While the perceptual tasks surveyed in the previous sections all depended for successful performance on the adoption and maintenance of appropriate mental sets, those to be discussed below probed quite specifically the subjects' capacity to shift and apply attitudes required by the test. An auditory experiment with the same three groups of subjects as reported on in this paper, and presented in considerable detail elsewhere (27), demonstrated that our Korsakoff patients were less successful in developing appropriate anticipatory sets as indicated by situational cues, that they relinquished expectancies more readily when these were no longer reinforced, and that they were almost entirely incapable of utilizing two sets concurrently. They were not noticeably less efficient than the con-

trols in using a single set, nor did they perseverate with such sets when these were no longer applicable. In brief, the Korsakoff group showed sufficient flexibility to change from one anticipatory set to another over comparatively long phases of a test, but not to switch to and fro in rapid succession. Their capacity to shift their attention and orientation was further explored by other procedures.

Concentration. The purpose of this experiment was to test the subject's ability to shift his attention. Four lists of letters and four lists of numbers, 10, 18, 8, and 12 items long, were read aloud at an even pace, keeping an interval of two sec. between any two items. The subject had no foreknowledge of how long each list would be, and his task was to repeat the last five items heard in the original sequence, after the experimenter had signalled the end of a list by tapping his pencil on the desk. The score consisted of the number of items reported in the correct order. Mean scores derived from the combined four letter series and separately the four number series are set out in Table 12. While the performance of the Korsakoff patients on the digit span test excludes the explanation that the significant differences shown on the present task resulted from a defect in immediate recall, they should not be taken as indicative of a general impairment in concentration. The fact that these patients followed their instructions accurately and attended to their tasks in a variety of experiments would argue against such a conclusion. It was evidently the difficulty of continuously readjusting their attention which put them at a disadvantage.

Embedded figures. Gottschaldt's (10) test poses the reverse of the problem in completion tasks. It is based on the principle that certain whole patterns, far from being aggregates of their component parts, absorb these parts to an extent that they are difficult to recognize or identify. Proficiency

TABLE 12

Items Correctly Reported on the Concentration Test

	Korsakoff N = 24	Control I N = 20	Control II N = 8	*t* ratio	
				Kors.-Contr. I	Kors.-Contr. II
Letters	10.9	15.3	14.5	3.9**	3.3**
Numbers	8.4	13.5	14.4	5.2**	4.4**

** $p < .01$.

in locating the simple figures presented on the left within the associated complex design on the right of Figure 5 is thought (21, 15) to indicate an ability to hold in mind simultaneously several aspects of the same situation. The test material followed Thurstone's (29) model, so that section I included seven designs, each of which embedded Figure A, while those in the other three sections embedded one or another of two figures. Figure D occurred in six designs of section II, Figure B in four each of sections II and III, Figure C in three designs of section II and two of section IV, eight of which embedded Figure E. To

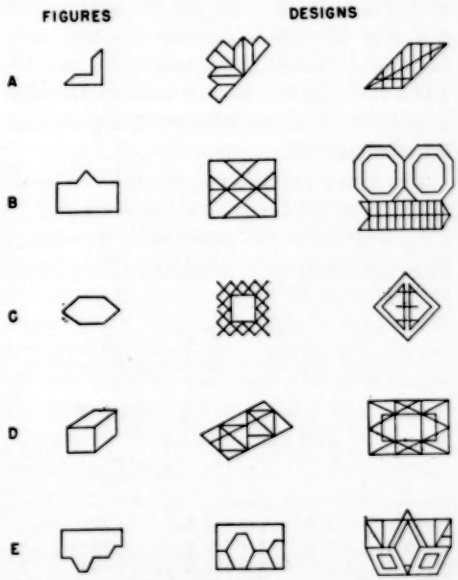

FIG. 5. Embedded figures

start with, subjects were instructed to find examples of Figure A in section I, and to shade in the appropriate area with a pencil. The experimenter demonstrated the procedure with one example. On the subsequent sections the choice of the subject was not restricted by instruction unless he failed to make headway. As it happened all Korsakoff patients, though not all controls, had to be helped by showing them the two figures they could detect in each of these sections. The time allowed for the entire task was 50 min., and no premium was offered for speedy solution. Erroneous attempts were not recorded, a subject's score, therefore, consisted of the number of designs in which he correctly shaded in a figure. Four Korsakoff patients in a sample of 21 finished with a score of zero, and only five achieved any success beyond section I. Their mean score was 2.5, as compared with 17.5 in a control group I of 10, and 11.2 in a control group II of 5 members. Comparing the first two there was no overlap of scores, and the difference in the second comparison was significant at the .01 level with a z score of 3.12. By the evidence of this test Korsakoff patients are not only capable of adopting a perceptual set toward the whole, but less able to abandon it in favor of an orientation to a part than are the controls.

Reversible perspective. Necker's cube, all 12 edges of which are visible, was used as a figure of reversible perspective. The model was painted in white lines on black ground, the two frontal parallel squares measuring 10 x 10 in., the sloping edges 7 in. in length. The subject faced the model from a distance of six ft., his eyes being at the level of its lower edge or somewhat below. He was allowed two to three minutes to become acquainted with the phenomenon of reversible perspective, or longer if necessary; however, if the illusion was not experienced in five minutes the experiment was postponed. The experiment itself consisted of observing the figure for six periods, each of sixty seconds. The subject was given a counter with the instruction to press its key each time he observed a shift in the position of the cube. No other instructions were given for the first period; alternate subjects were asked to try and "hold" the cube in the same perspective, *i.e.* resist oscillation, or to reverse its perspective as fast and frequently as they could, in the second and third periods. The instructions for the last three periods were the same as for the first three, following in reverse order.

TABLE 13

Necker Cube: Mean Reversal of Perspective

	Korsakoff N = 22	Control I N = 16	Control II N = 6	t ratio	
				Kors.-Contr. I	Kors.-Contr. II
Watch	7.5	11.7	4.5	5.8**	1.2
Hold	5.3	7.4	3.7	3.5**	.7
Reverse	7.0	15.6	5.5	z = 2.98**	.6

** $p < .01$.

All 16 alcoholic and all six neurological controls succeeded in observing the illusion, while seven of 22 Korsakoff patients failed to do so on both the first and on a second occasion, and another four who were able to reverse the perspective in the preparatory period on at least one occasion, did not succeed in doing so during the six test periods. Every member of the control groups observed at least one instance of oscillation in each test period. Table 13 lists mean reversals per 60 sec. for the three groups, the Korsakoff being limited to the 15 patients who passed the preparatory test. Only control group I differs significantly from the Korsakoff group, observing more reversals under each of the three experimental instructions; control group II deviates in the opposite direction but in no instance significantly. Control group I succeeded in significantly reducing the incidence of reversals under "hold" directions (t = 5.80, $p < .01$), and to increase it when so in-

structed ($t = 2.7, p < .05$); in control group II these changes were not statistically significant, neither was the decrement in the Korsakoff group, whether in line with or contrary to the experimental instruction. More noteworthy than differences between mean scores or in changes according to different experimental instructions was the finding that only four Korsakoff patients reported more reversals under the direction to encourage oscillation than under standard conditions, while all but three control subjects, all out-patients, did so. Even though the discrepancy was less marked with instruction to resist oscillation, the experiment suggests that the Korsakoff patients are handicapped by a severely lowered capacity to change perceptual sets.

Constancy of shape and size. Although the retinal image of a match in one's palm may be larger than that of a telegraph pole in the distance, it still looks smaller; a book looks rectangular no matter what angle one observes it from, no matter how different its retinal image. The tendency of organisms to respond to objects or events as total patterns within their context, rather than to specific stimulus combinations is technically known as "constancy". The phenomenon applies to color, brightness, and speed as well as to size and shape, and is not necessarily absolute; at least in careful perceptual analysis it tends to manifest itself as a compromise between the values of the "real" and the projected, size, shape, etc. The degree to which it approximates the real is the measure of the constancy effect. The phenomenon of perceptual constancy is as significant biologically as it is common, and its effective operation obviously depends on the utilization of cues. Experiments measuring the constancy effect require a reorientation from a well established perceptual attitude, and this can be assisted by the reduction of relevant cues. Since the experimental task thus demands a divorce of the test object from its surrounding, Korsakoff patients were expected to deviate from the normal response in either of two directions, either by ignoring the relevant cues and therefore approximating the projected shape or size or, more probably, towards overconstancy because of their inability to abandon an object-focused perceptual attitude. Three experiments were conducted, two on shape, one on size constancy, the last of which did not significantly differentiate between Korsakoff and control groups.

(a) *Tilting circle.* A metal circle 8 in. diameter, painted white and surrounded by a dull black rim, was so mounted that it could be rotated around its horizontal as well as around its vertical axis, by turning the mounting at the base. At a distance of one ft. in front of the midpoint of the circle stood a metal screen also painted dull black, with an adjustable aperture. The size and shape of the aperture could be altered by means of two sliding shutters working from the opposite direction, and by setting the mechanism at various angles on a circular dial. Furthermore, the aperture could be cut off at any of the four corners by means of semi-circular flaps pivoted at the corners of the shutters. The purpose of this screen was to provide a uniform black surround for the white circle, no matter at what angle it was tilted. The circle was illuminated by four electric lights mounted at the inside corners of the screen, so that no shadow of extraneous objects was cast on it. The experiment consisted of 29 comparisons, in each of which the standard circle was tilted at a different angle; the subject's task was to select from a graded array of white cardboard ellipses the one that "looked most like in shape to the white figure shown behind the screen." The standard was presented five times each with the horizontal axis in the frontal parallel plane, and at deviations of 15, 30 and 45 degrees, and four times at a deviation of 60 degrees. In each of these planes the circle was shown once only in vertical position, and once each at a tilt of 40 and

20 degrees from the vertical with the lower edge nearest, and 15, 40, and 60 degrees from the vertical with the top edge nearest. The position representing 60° deviation from both axes in the frontal parallel plane was omitted because it defied adequate screening. Two sets of comparison objects were provided; series (A) which consisted of ellipses ranging from size 2½ x 8 in., in steps of ½ inches up to 6 x 8, and thence by ¼ inches to the full circle 8 x 8 in.; and series (B) which had 7 in. for its longer axis, and along the shorter axis ranged from 1½ to 7 in. in ½ in. steps. However, since items of series (B) were hardly ever used, and only rendered the procedure more cumbersome, they were omitted in the later stages of the study. The positions of the standard circle followed the same standardized order with each subject, from whom the experimenter's adjustment of this and of the screen was concealed by means of a second and larger floor screen placed in front of the entire apparatus. The subject was sitting at a distance of 11 ft., with his eyes about level with the midpoint of the standard, the comparison objects were spread out on a bench at his side or, when both series (A) and (B) were in use, one set on either side.

The results, whether expressed as deviations from the retinal projection of the standard, or converted into constancy ratios (4) as in Table 14, showed consistent and significant differences between the Korsakoff patients and either control group. The most striking finding of this experiment was the strong tendency toward over-constancy

TABLE 14

Constancy Ratios: Mean of 28 Comparisons with Circle at Various Angles

Korsakoff N = 19	Control I N = 12	Control II N = 8	*t* ratio	
			Kors.-Contr. I	Kors.-Contr. II
50.6	12.8	11.4	14.2**	$z = 2.58$**

** $p < .01$.

in the Korsakoff group. One of its members matched the standard with the full circle no matter what position she saw it in, and four others did the same in 18 instances or more. The Korsakoff group chose the full circle altogether 213 times when this was not the closest match of the retinal image, as compared with 31 instances in control group I and 17 in control group II. Qualitatively the most notable differences were the following: the controls showed the least constancy the closer the standard came to the frontal parallel plane: the Korsakoff group showed the highest constancy in this region and the least in the intermediate region. The lowest mean ratio for the Korsakoff group, 21.8, occurred when the standard was tilted 15° in a plane subtending an angle of 30° with the frontal parallel; and tended to approximate complete constancy when the angle increased to 60°, with a mean ratio of 71.8.

(b) *Foreshortened diamond.* A white diamond shaped cardboard 12 x 12 in. mounted on a black background served as a standard, and was placed on the floor 16 ft. from the subject who looked at it with his left eye through a cardboard tube 40 x 2½ in., which acted as a reduction screen. The vision of the standard with the right eye was obstructed whereas the comparison objects were in full view of it. These objects were mounted on a rotating frame, so that the subject could see only one at a time through a 12½ x 12½ in. aperture. They consisted of a series of eight white diamond shaped figures measuring in their vertical axis 6, 7, 8, 9, 5, 10, 12, 11 in.; their width was constant, 12 in., and they were all mounted on black cardboard 12½ x 12½ in. The subject's task was to say each time whether the comparison object looked the same as the standard. When this was completed with all eight objects, the subject had to choose from those he equated with the standard that one which looked most closely like it, and for this purpose he was shown the test objects once

more, o ras many more times as he needed to make up his mind. The experimental group consisted of 18 subjects, and there was only one control group composed of 15 out-patients.

The experiment yielded two results of note: (i) The Korsakoff patients tolerated a much wider range of identity, *i.e.* they equated the standard with more comparison objects; and (ii) their range and their single choices showed a much higher degree of constancy. Their mean number of equations was 3.22 (SD = .94), as against 2.27 (SD = .88) of the control group, giving a difference significant at the .01 level, (t = 2.88). The mean final comparisons were 10.50 and 8.26 for the two samples. (t = 3.80, p < .01), with ten of the Korsakoff group choosing the 11 in. tall shape, and all but one 10 in. or taller, while the controls were fairly evenly spread over the entire range from 5 to 11 in., the mode being at 8.

DISCUSSION

On the basis of clinical observation Korsakoff's psychosis is generally characterized by two major psychological symptoms, memory disturbance and confabulation. The former may be qualified by distinguishing an impaired capacity of learning or acquisition from the amnesic symptom of defective memory or retention. The present survey over a wide range of perceptual tests and based on a comparatively well preserved sample of chronic Korsakoff patients, indicates that the psychological damage characteristic of this disease extends beyond impaired memory and learning. In view of these findings the cognitive disorder in Korsakoff's psychosis may appear to be more severe than would be suggested by the customary definition of the syndrome, for it evidently pervades many simple mental processes which are not dependent on sound memory function. Yet the present report also allows for a different conclusion, since it has demonstrated that although the perceptual deficit in Korsakoff's psychosis is extensive, it is not general. There is certainly no evidence here for anything like a total dissolution of the perceptual functions, even though efficiency or capacity may be reduced. Some processes appear to remain undamaged by the disease, more particularly those involved in the integration of fragmentary information into perceptual wholes. The absence of statistically significant differences between the Korsakoff group and the hospitalized controls on tests of perceptual span by means of printed words, merely raises the question of practice effects without allowing for any confident conclusion. More suggestive is the finding that the Korsakoff patients performed without apparent loss of efficiency in simple tests requiring judgments of identity, when the objects compared were simultaneously within their sensory reach. They were, however, consistently inferior to the control groups in more complex tests of comparison and discrimination, and on all tasks involving the prolonged maintenance or flexible reorientation of appropriate perceptual sets.

We conclude therefore that the perceptual operations least likely to be damaged in Korsakoff's psychosis are those which depend on the immediate apprehension of a unitary image or situation. Unity in this context is understood both in the temporal and spatial dimensions; immediacy means that neither an intermediate process of imaging nor of a reorientation to the object or situation observed is involved. In completing a fragmented image or word, in filling in the missing detail, the Korsakoff patient was unlikely to succeed if he had failed on the first attempt; there were few instances when his repeated trials resulted in the correction of an originally misperceived figure, letter, or word. The success of the Korsakoff group in accurate tactual and visual matching of width or length is thus explained by the simultaneous presence of the objects of comparison, as is

their failure in tasks of comparison which require an intermediate operation of imaging in order to check the accuracy of judgment. It is, of course, debatable whether the visual tasks of multiplication and division were simply perceptual or involved higher conceptual processes, though that in itself need not have caused special difficulties for these patients who can cope quite efficiently with simple arithmetical problems. Their inaccuracy in visual and auditory discrimination could therefore be caused by an incapacity to image the standard of comparison which is physically absent. Control experiments, which presented simultaneously a standard and an object of comparison, clearly demonstrated that the relative failure of these patients in perceptual discrimination is not due to a blunting of sensory acuity.

Does the suggestion that the Korsakoff patients' perceptual efficiency breaks down over some intermediate process of imaging, of "carrying in the mind" some standard while reproducing or checking it, support Lidz's (19) argument that only the memory disorder is primary in this disease? In principle the various experimental observations of perceptual impairment in Korsakoff's psychosis could be secondary effects of a primary memory disorder, for normal perception often, perhaps always, proceeds by supplementing and structuring the sensory input with appropriate memory images. However, in the present study it was found that the Korsakoff patients functioned most adequately in perceptual tasks which required precisely this, and nothing beyond the aptitude of completing the sense data with the help of a memory image, *i.e.* in the visual and tactual figure completion tests. Moreover, there were several other experimental findings which confirmed the clinical observation that the onset of the perceptual error was instantaneous rather than a function of delayed testing and interference. In the visual identification test, for example, checking the standard immediately prior to judgment did not improve accuracy of judgment. In determining the identity or difference of two short musical patterns presented in quick succession or in reproducing the briefest temporal interval the Korsakoff patients performed as poorly as in judging longer phases or sequences. Yet they could repeat long sentences presented aurally without error, even though the load of information was heavier, but also more familiar and more sharply defined than that of a musical pattern or of a sound of indeterminate length. We have also the paradoxical observation that the larger number of exposures the Korsakoff patients needed for reading sentences in instalments, the more additional presentation they tended to require before they could reproduce them as wholes. Paradoxical that is in the light of learning theory, for this finding is not incompatible with a basic perceptual defect, more particularly with an impairment in the sequential integration of experiences as suggested by our study with apparent movement (26).

If this impairment is seen as another manifestation of a general sluggishness in reorienting attention, one that also appears in failure to shift from an object to other disconnected objects in the visual field of the tachistoscope, or from object of comparison to the standard and back in the various tasks of perceptual judgment, we come closer to defining the primary perceptual defect in Korsakoff's psychosis. Previous students (22, 17) of this disease have suggested that a failure to test the accuracy of solutions, an uncritical acceptance accounts for, at least, its confabulatory symptoms. The Korsakoff patient's rigid dependence on the stimulus or on his own original perception of it indeed prevents him not only from revising his percepts, from "checking their accuracy", but furthermore also from integrating them with other data.

More evidence of this attitudinal inflexibility has been furnished by the experi-

ments with perceptual sets. The tests of concentration and with the Necker cube alike demonstrated the Korsakoff patients' reduced capacity to shift their attention. The same conclusion was drawn from the auditory experiment (27) which required the application of two anticipatory sets simultaneously or successively. That study also provided for a closer definition of the Korsakoff patients' attitudinal inflexibility, for it showed that they could change their expectancies by abandoning one that was no longer confirmed by the immediate sensory input, but were unable to switch to and fro in rapid alternation, *i.e.* maintain one set while applying another. The experiments with the hidden figures and with shape constancy further support this line of reasoning, for success with both types of task depends on a twofold orientation. With the Gottschaldt figures the subject must attend both to the complex design and to the simple figure simultaneously. For most people it is difficult to ignore the whole design while trying to extricate the test figure from its strongly structured pattern; for the Korsakoff patient this task becomes virtually impossible. Measures of constancy likewise represent a compromise not only between retinal image and the true dimensions of the object, but also a compromise between two perceptual sets, those of object-judgment and sensory judgment (30). In order to achieve the compromise the observer must be at once oriented toward both aspects of the object. The Korsakoff patients proved to be too rigidly object-bound to be capable of exercising sensory judgment. This was their case both with the tilted circle and the diamond seen at an angle, the latter showing that even the minimal cues of texture and light available to monocular vision through a reduction screen are sufficient to impose the object character on perception. The failure of the size constancy experiment to discriminate between the Korsakoff and control groups was probably due to the fact that sensory and object judgment did not differ sufficiently in that setting to test the effect.

The results of a study with apparent movement have already been quoted as illustrating this same disturbance in perceptual sets. The reasoning advanced (26) in support of this interpretation rested on the consideration that impaired capacity to sustain or change anticipatory sets will necessarily disrupt or prevent the serial integration of percepts. In the Korsakoff patients even the very brief interval of darkness disrupted the orientation aroused by the first exposure of the test figure, while the controls sustained it through this interruption. It is significant that the Korsakoff patients were more likely to sustain this expectancy when it was supported by past experience, and the phenomenon did not depend entirely on conditions experimentally induced in the laboratory, *i.e.* when the experimental material represented a car in motion instead of an abstract figure. In a detailed discussion of this study the findings were also considered as indicative of the Korsakoff patient's familiar memory disturbance. It was suggested that owing to his inability to integrate successive impressions or experiences he fails to establish those schemata (1) or trace aggregates (18) which are the media of remembering and learning.

The evidence of the studies reported supports the argument that the Korsakoff patient's perceptual impairment is not secondary to his amnesic disorder, although this does not imply the conclusion that his memory disturbance is not also a primary symptom. The perceptual deficit certainly could not account for the symptoms of retroactive amnesia without further elaboration. The operation of the attitudes or, possibly, of motor acts by which deliberate recall is elicited may be similar to the constructive process in perception; indeed, it may be the same neuropsychological process, or the function of a common underlying process, one most closely defined by

such terms as attention, constructive orientation, or attitudinal readiness. To carry the parallel further, however, would lead too far into speculation, for only in a loose sense does the recollection of more recent events involve a reorientation from earlier experiences, or is a longer established memory less dependent on a selective process for its availability. While it is the purpose of scientific research to subsume diverse phenomena under common explanatory principles, the possibility of multiple causation should not be ignored; and it certainly must be entertained as a hypothesis to account for the various mental symptoms in Korsakoff's psychosis. The very tentative nature of the model advanced to embrace the several cognitive defects in Korsakoff's psychosis is stressed by the finding that no stable hierarchy of efficiency or incapacity could be established within our experimental sample, so that a patient with a relatively good performance record in one test would tend to score near the top on most other tasks; or that patients exhibiting a serious perceptual disturbance in one situation would invariably also show severe deficit in tests of recall or learning or indeed in any other perceptual test.

The major conclusion to be drawn from this study therefore is that the perceptual damage in Korsakoff's psychosis need not be regarded as secondary to the memory disorder. It is a basic symptom consistently present in the disease, though neither so apparent in the clinical setting as the amnesic condition, nor necessarily unique to this neurological syndrome. The perceptual and amnesic symptoms could be a joint function of some common underlying disturbance, they could manifest a causal relationship, or possibly they are only loosely or fortuitously related, though both are always present in this disease. The present survey of the perceptual disorder in Korsakoff's psychosis is offered first as a contribution toward the description of the disease, and second as a paradigm rather than an explanation of the general cognitive disorder characteristic of the amnesic syndrome.

SUMMARY

A battery of psychological experiments exploring various perceptual processes, shows that the cognitive disturbance in Korsakoff's psychosis is neither exclusively, nor primarily in memorizing or learning. Patients suffering from this disease, even when capable of rational behavior and immune from confusional and confabulatory symptoms, are markedly defective in their perceptual functioning. Comparing them with controls drawn from psychiatric patients in an alcoholic clinic and from hospitalized neurological patients not diagnosed as brain damaged or as alcoholic, the Korsakoff patients show a deficit on most perceptual tests. A notable exception to this observation are tasks which depend on the immediate apprehension of spatially and temporally unitary patterns or situations. The several discrete findings of this study can be subsumed most satisfactorily under a common principle by thinking of the Korsakoff patient as limited in his capacity to sustain more than a single perceptual set or attitude at a time, or to alter his orientation while the sensory input continues to confirm an expectancy he has adopted. This dependence on one aspect of the stimulus situation prevents him from integrating experiences, which may be the cause of his inability to learn or recall them; it also deprives him of those constant checking operations the absence of which has been proposed as an explanation of confabulatory behavior. The perceptual disorder appears to be a primary factor in the mental syndrome characteristic of Korsakoff's psychosis; though indeed it may jointly with other cognitive defects manifest a common underlying attitudinal impairment.

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CHLORPROMAZINE IN SCHIZOPHRENIC WITHDRAWAL AND IN THE WITHDRAWN SCHIZOPHRENIC

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INTRODUCTION

It is frequently urged that the ataractics are symptomatic rather than curative drugs. The author (16) has previously expressed agreement with this opinion and with the view that studies of these agents should be chiefly directed toward clarification of their detailed symptomatic effects. The present report describes an attempt to answer the following questions regarding the action of chlorpromazine in a frequently observed constellation of symptoms, "schizophrenic withdrawal": (a) Does chlorpromazine alleviate "withdrawal" in the chronic schizophrenic? (b) Does chlorpromazine produce general improvement of psychiatric status in the withdrawn schizophrenic? (c) What is the prognostic significance of intensity of "withdrawal" for the outcome of chlorpromazine therapy in such patients?

In schizophrenic patients certain distortions of social and motor behavior, verbal behavior (as distinct from content), and emotional expression occur together with sufficient frequency to warrent their designation as a symptom complex. This complex, which we shall call "withdrawal", includes the symptoms of seclusiveness, unsociability, introversion, inattention, inaccessibility, hypoactivity, verbal retardation and emotional flattening or apathy. The severity of withdrawal may be said to depend upon the number of these symptoms present and the severity of each.

There are other symptom complexes of importance in the study of clinical psychopharmacology. "Psychotic content" (delusions and other bizarre ideation; hallucinations) is one such complex. Great prominence in the literature on drug therapy has been given to a symptom complex usually termed "agitation" or "psychomotor excitement", which includes hyperactivity, assaultiveness, destructiveness, incontinence, untidiness, noisiness, overtalkativeness, anxiety, "nervous tension", rage. Patients with these symptoms are often said to be "disturbed". The widely acknowledged ability of chlorpromazine and certain other compounds to relieve agitation is the basis for the class names, "ataractics", "tranquilizers", now applied to them.

The literature pertinent to our central questions will be reviewed in a later section but this may be said now: While there is general agreement regarding the tranquilizing properties of chlorpromazine, there is sharp difference of opinion with respect to its effect on withdrawal. It was this fact which directed our attention to the study here reported.

METHODS

This study was conducted on a group of 22 chronically ill, white, female, schizophrenic patients. They had been hospitalized continuously for a minimum of five years and for the two years prior to this study had been part of a larger research ward population participating in research on group psychotherapy. Our 22 represent those patients who failed to respond to group psychotherapy and who had not previously been treated with drugs. All had been repeatedly diagnosed as schizophrenic.

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All had received extensive electroconvulsive therapy and some had received deep coma insulin without permanent benefit. Based upon the rating scale data to be described shortly it may be said that all were more withdrawn than normal but that the severity of this symptom complex ranged from nearly normal to very severely withdrawn. Psychotic content and agitation, as judged by clinical observation, were similarly present in the group in widely varying degrees. Ages ranged from 30 to 50 years and no patients were suffering from major physical or neurological disease.

The subjects for this study were not selected until three months after the termination of the group therapy project. During that three month period certain limitations of individual and ward activity and of doctor-patient contact, which had been imposed by the design of the earlier research, were eliminated. None of the present group was clinically benefited by this "correction" of milieu problems.

Two separate measures of withdrawal were obtained for each subject. The first, which we shall call the direct judgment measure, was secured by having three independent judges (the ward nurse, a research assistant in frequent contact with the patients, and the writer) rank order the group for severity of withdrawal, the symptom complex being defined as in the preceding section. Judgments were made on two separate occasions during the pretreatment period at an interval of about three weeks. The two rankings of each judge were then combined (by ranking their sums) and the rankings of the three judges similarly combined to obtain a direct judgment baseline rank order of withdrawal for the subject group. The direct judgments were found to be highly reliable. Agreement of each judge with his own previous rank order was shown by Spearman rank correlation coefficients of .87, .91 and .89, and agreement between judges by a Kendall coefficient of concordance of .79. All measures of reliability are highly significant statistically.[2]

The second or rating scale measure of withdrawal was obtained in the following manner. Seven items[3] were selected from the Southeast Louisiana Hospital Behavior Rating Scale (16) as components of the symptom complex under study. Patients were rated weekly for eleven weeks before treatment, the ratings made by attendents, the ward nurse and the writer. A mean weekly score was calculated on each item for each patient, the deviation of that score from the "normal" point in the direction of withdrawal being assigned a negative value, that in the opposite direction a positive value. The algebraic sum of the seven items for each week, summed again for the eleven baseline weeks constituted a patient's baseline rating scale score.

Agreement between the two methods of measuring withdrawal was satisfactory. Spearman rank correlation coefficients for the rank orders of each of the three judges with the rank order obtained from rating scale scores were: .85, .75 and .69. Treatment and control groups of 11 patients each, matched for withdrawal, were established by combining the direct judgment baseline rank order and a rank order based upon the baseline rating scale scores. Matched pairs were obtained by taking the first and second, third and fourth, etc. patients in this final order and one member of each pair was assigned to the treatment group by the toss of a coin; the other member falling to the placebo group. The results of this assignment were not known

[2] Descriptions of the statistical procedures used may be found in Reference No. 32.

[3] The items were sociability, attentiveness, general muscular activity, daytime sleepiness, talkativeness, flatness of feeling, appropriateness of feeling. It should be noted, however, that raters completed the entire scale and that of the eight raters only the writer was aware of the particular items to be selected for this project.

to the judges, raters or other ward personnel.

Medication, chlorpromazine tablets or concentrate or corresponding placebo tablets[4] or solution, was dispensed from containers bearing only the name of the patient. All administration was oral. The routine initial dosage was 50 mg. t.i.d. and this was gradually increased until symptomatic or mild side-effects were noted or until a level of 750 mg. per day was reached. The treatment was continued for 20 weeks.

Direct judgments of withdrawal were made at the end of each of four five-week intervals. Weekly ratings were continued as during the baseline period and the data was divided into four five-week periods for analysis.

It was necesary to discontinue medication during the third week on one patient in the treatment group because of the development of a severe angioneurotic edema (15). This patient was eliminated from the project. Another patient receiving chlorpromazine was temporarily discontinued on two occasions of three weeks each because of side-effects (weakness, skin rash) but was able to resume treatment and was included in the study.

RESULTS

Analysis by means of the Mann-Whitney U test of the direct judgment data failed to reveal significant differences in withdrawal between the treatment and control groups during any of the four treatment periods. The Friedman two-way analysis of variance by ranks applied to the treatment group direct judgment data for the baseline and four treatment periods failed to reveal significant change over time.

The same tests applied to the rating scale data also failed to reveal significant differences in withdrawal between chlorpromazine and placebo groups or significant change in withdrawal within the treatment group during the period of therapy. In addition it was possible to analyze the rating scale data in terms of differences between the members of the ten complete pairs, the rationale for this additional analysis being that differences between paired patients might have been obscured in the analysis of total group differences. This further analysis, using the Wilcoxen matched-pairs signed-ranks test, also failed to reveal significant differences between treatment patients and controls.

Using successful change in hospital status (*e.g.* acquisition of grounds privileges) as the criterion of improvement in total psychiatric impairment it was found that none of the 11 control group patients were generally improved while five of the ten chlorpromazine-treated group were distinctly improved. The difference in general psychiatric improvement between these two groups is significant at the .05 level of confidence (binomial test).

Of the five improved patients, three were moderately so, for the first time achieving and holding grounds privileges and participating successfully in the hospital's work therapy program. One of these three was placed on convalescent status at the end of the project after six years continuous hospitalization. Two patients were slightly improved, the first being placed on convalescent status in a very protected situation which had been constantly available during the five years of her hospital stay but to which she had not earlier been able to adjust. The second slightly improved patient, whose family visited regularly during the 14 years of her hospitalization, now had her first pass (home visit) in 14 years.

These five generally improved patients were evaluated for alleviation of withdrawal by comparison with their counterparts in the placebo group, employing the rating scale measures of withdrawal for each matched pair for each of the four treatment periods. Analysis of direction of

[4] Kindly supplied by Smith, Kline and French Laboratories.

difference between pairs (sign test) failed to reveal significant alleviation of withdrawal in this group of patients showing general psychiatric improvement.

Within the chlorpromazine-treated group an analysis was made to determine the possible relationship between severity of withdrawal and general psychiatric improvement. Arrangement of the data in proper form for the application of the median test revealed that: of the five patients above the median in initial withdrawal (*i.e.* less withdrawn in the combined rank order), three were generally improved and two unimproved; of the five patients below the median in initial withdrawal, two were improved and three were unimproved. Analysis reveals complete absence of significant relationships between general psychiatric improvement and severity (or mildness) of withdrawal in this group of withdrawn chronic schizophrenics receiving chlorpromazine.

CONCLUSIONS AND DISCUSSION

From the results presented it is concluded: (a) that chlorpromazine does not alleviate the symptom complex, withdrawal, in the chronic schizophrenic patient and that this is true even for those patients with varying degrees of withdrawal who are improved in their general psychiatric status by chlorpromazine therapy; (b) that withdrawn chronic schizophrenic patients may, as the result of treatment with chlorpromazine, be distinctly benefited in behavioral areas other than withdrawal and thus in their general psychiatric status; (c) that severity of withdrawal (in a patient group more withdrawn than normal) is not related, favorably or unfavorably, to the general psychiatric improvement resulting from the administration of chlorpromazine.

While it is true that the number of subjects in this study is small and the conclusions therefore tentative the controls imposed and the conditions of data collection and analysis are thought to justify the above generalizations. Moreover, an effort will now be made to demonstrate that the results and conclusions of this study complement and clarify rather than contradict much of the relevant literature.

A great many of the papers on chlorpromazine have no relevance to our particular subject. Chiefly these are reports of workers who have been impressed with the dramatic tranquilizing properties of the drug with little or no attention to its effects in other behavioral areas. The pioneer contributions of Delay *et al.* (5), (6), Lehmann and Hanrahan (21) and Winkelman (36) fall within this group. There is no need to cite in detail the numerous workers following a similar approach.

Of the pertinent contributions, mention may first be made of those who report findings or impressions which are direct contradictions of and which cannot be reconciled with our results. Bordeleau (3) refers specifically to a "loss of the power to withdraw" observed in his chlorpromazine-treated schizophrenic patients and infers a "direct effect upon the autism of schizophrenia". Brooks (4) reports: "Particularly impressive has been the striking facilitation of communication with patients with chronic schizophrenia. Even before the patients began to lose their hallucinations and bizarre ideation, it became possible to talk directly with the person behind the disease." Kinross-Wright (19), in a report focussed on control of psychomotor excitement, asserts that communication is facilitated in the chronic schizophrenic and in a second paper (18) pointedly attributes increased communication, increased social responsiveness and increased depth of affect to some process more basic than sedation or increased appetite. Gardner *et al.* (11), using the Lorr behavior rating scale, found a slight advantage for chlorpromazine over reserpine in the treatment of "the schizophrenic reaction of resistive isolation and withdrawal from environment". And Rock-

more, Shatin and Funk (28) concluded from results obtained in behavior rating studies: "The area which most profited by thorazine treatment ... involved communication and socialization." These authors also report best results in the passive and noncommunicative patient who is not necessarily hyperactive or motorically disturbed.

In contrast there are a number of reports which seem in full accord with the results of the present study. Litteral and Wilkinson (22) state that, in their experience, chlorpromazine does not favorably influence the primary thinking disorder or the apathy of schizophrenia. The Michigan Department of Mental Health (23) statistics show "withdrawal" the least improved of nine symptoms studied; while tension, appetite and combativeness were the most markedly benefited. Porteus (26) found "asocialization", which he directly equates with withdrawal to be the only behavior trait of 12 in his scale which was entirely unaffected by chlorpromazine administration. Rinaldi, Rudy and Himwich (27) and Rudy, Rinaldi and Himwich (29) found that while reserpine and possibly ... azacyclonol had some value in producing an "emergence from apathy and withdrawal", chlorpromazine seemed to owe its beneficial effects more strictly to its tranquilizing properties and may even enhance apathy, passivity, autism and catatonic features. These authors found that chlorpromazine aggravated withdrawal, apathy, passivity and seclusiveness in some schizophrenic patients. Abrams (1), reporting a study on a population very similar to ours and using the Lorr behavior rating scale, concludes that withdrawal is not affected by chlorpromazine therapy.

The foregoing deal directly with the present problem and are in clear agreement or disagreement with our report. Such papers are, however, not the rule. More frequently "withdrawal" or the withdrawn patient are mentioned incidentally as part of a description of the tranquilizing effects of chlorpromazine. This approach tends to obscure the important distinctions between general improvement in the withdrawn patient and improvement in withdrawal itself and between alleviation of the isolation and social inacceptability which is a secondary consequence of "disturbed" behavior and modification of the more primary phenomenon of withdrawal. If these two sources of confusion are kept clearly in mind, it will be apparent that much of the published opinion concerning chlorpromazine and withdrawal is entirely compatible with the results of the present report. Thus Delay *et al.* (6) point out that symptoms such as mental confusion and inattention disappear "*at the same time* as the agitation" (italics ours). Vaughan, Leiberman and Cook (35) show in their tabulation of schizophrenic symptoms benefited that withdrawal was relieved in seven of eleven patients with that symptom but their discussion is clearly focussed upon the outstanding effects of chlorpromazine on aggressiveness, noisiness, overactivity, agitation and tension. Denber and Bird (7) report increased interest and diminution of detachment and isolation in chlorpromazine-treated chronic patients. In their cases, however, symptoms in the area of psychotic content were also dramatically relieved. Shepherd and Watt (31) emphasize the favorable results obtained in a population chosen "not for their aggressiveness and overactivity ... but on account of their apathy and inertia". The present findings are in agreement, much improvement may be expected in such patients, the question being that of the specific behavioral areas improved. The single schizophrenic case reported in detail by Shepherd and Watt (Case 9) clearly shows that the patient experienced improvement in destructiveness, aggressiveness, incontinence, untidiness. It is possible that her simultaneously increased friendliness and responsiveness may have been made possible by alleviа-

tion of these antisocial behavior traits. Feldman (9), in a study comparing various ataractics does not include withdrawal among his 24 symptoms evaluated. Sociability and accessibility were increased by chlorpromazine in about half of his cases but hyperactivity, hostility, combativeness and tension were even more consistently relieved. Sottong (33) finds in chronic schizophrenia that chlorpromazine has "a calming effect and makes the patient more social". He, as well as Kinross-Wright (17), Goldman (13) and others, refers to the usefulness of the drug in making the patient more accessible and therefore more amenable to milieu therapy and formal psychotherapy. In Goldman's presentation, it may be noted, the discussion of this point follows a lengthy discussion of the efficacy of chlorpromazine in diminishing "delirium" and abnormal ideation. In another place Goldman (12) lists the symptoms influenced by chlorpromazine, beginning with delirium and excitement, continuing through hallucinations and chronic motor manifestations, and reaching "social manifestations", which, he explains refer to "*soiling, wetting and other untidiness*" (italics ours). These are indeed social manifestations, but of the kind which prevent social intercourse by driving others away rather than because of the withdrawal of the patient. Pollack (25) remarks that "Thorazine acts by facilitating communication and permitting an objective viewpoint..." but continues: "Thus it is useful in situations associated with anxiety, fear, apprehension, suspicion, certain depressions and hypochondriacal states. Observers ... are in general agreement that agitated, openly hostile, aggressive, excited, anxious, fearful, and resistive patients show a high response to this medication." Agitation, anxiety, hostility, etc. are without doubt barriers to communication. It is not difficult to see that their relief might bring about distinct, but secondary, improvement of "communication".[5] Papers containing findings of the type discussed in this paragraph are, given the proper interpretation, believed to constitute support for the assertion that chlorpromazine does not affect withdrawal but exerts its primary action upon other behavioral areas, notably agitation, with secondary effects upon certain aspects of social activity.[6]

It is beyond the purpose of this paper to enter into a lengthy discussion of whether chlorpromazine exerts its action upon the "primary schizophrenic process". Opinions pro (13) (20) (30) and con (2) (8) (14) may be found in the literature. To the extent that withdrawal is a part of or related to primary schizophrenia, however, (and in Bleuler's conception it is certainly more closely related than agitation or psychotic content) the present study would tend to support the negative answer to this question. There is considerable merit to the view that the limited effects of chlorpromazine upon secondary symptoms may "initiate a reversal of the schizophrenic sequence" by alleviating the manifestations of the later stages of this sequence (1) or that such limited improvement may serve as a nucleus around which the patient may build further improvement if given the opportunity to participate in various rehabilitative programs including a therapeutic hospital milieu, formal psychotherapy and adequate social planning for release.

[5] In some cases communication may be increased simply because the patient has been subdued or, in Meerloo's (24) phrase, "medicated into submission".

[6] The symptom complex "psychotic content" is reported to be relieved by chlorpromazine (12) (26) (28) and this effect may also be a secondary or indirect one as indicated by the frequency of the observation that the emotional charge of or intensity of preoccupation with delusions or hallucinations are reduced before the content itself disappears (8) (10) (14) (25) (29) (30) (35). Thal (34) has observed that "delusions and hallucinations almost invariably subside and frequently disappear entirely, especially if they are associated with increased motor activity".

SUMMARY

The symptom complex "withdrawal" was measured in chronic, mildly to severely withdrawn schizophrenic patients by means of direct judgments and selected items from a behavior rating scale before and during a 20 week course of chlorpromazine therapy given 10 patients and a similar course of placebos given a matched group of 11 patients. Double-blind precautions were used. No differences in withdrawal between treatment and control groups following chlorpromazine therapy were revealed, even in those treated patients showing general improvement, nor did the treatment group show significant change in withdrawal over time. There was significant improvement in general psychiatric status in the treatment, as compared with the control group. Severity of initial withdrawal was unrelated to the occurrence of general improvement in members of the chlorpromazine-treated group. These findings are discussed in relation to earlier reports on this subject.

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INVESTIGATIONS OF THE URINARY EXCRETION PATTERN IN PSYCHOTIC PATIENTS[1]

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Earlier studies of the urinary excretion pattern of psychotic patients indicated a significant difference in the behavior of urines of the majority of schizophrenic patients from that of neurotics, cyclothymics and healthy adults in the glyoxylic acid (GA.) test, in that in the majority of urines of the former group a reddish-violet color appeared, which was absent in the majority of urines of the latter group (6). It was suggested that the positive reaction may be related to the presence of a substance with an indole nucleus, other than indole, possibly tryptophan or its metabolites. The following studies were made in order to obtain further information on the nature of the excreted indolic compounds, and also to attempt the elimination of some of the shortcomings of the GA. test.

PAPER CHROMATOGRAPHY OF URINARY INDOLES

The two-way ascending chromatographic method was used, with isopropanol-ammonia (Ipram) and butanol-acetic acid (BuA) solvents. Development and location was followed by observations under ultra-violet light and the "Fluorindal reaction" (3). The urines were also chromatographically analyzed for amino acids.

Urines were chosen from 14 schizophrenic and 7 non-schizophrenic mental patients. Relevant clinical data and results of the analysis are presented in Table 1.

The results of the analysis indicate the presence of an unknown compound of Rf 63 (Ipram) and 47 (BuA), (Figure 1) characterized by a rapidly appearing and quickly fading blue spot (QFB) in 12 out of 14 and its absence in two urines of schizophrenics, one of which came from a patient who had recently recovered. The unknown compound was absent in five of the seven urines of non-schizophrenics and when it was present, the urines gave also positive GA. reactions.

The comparatively small number of patients involved in the experiment allows no definite conclusions, but it appears that the unknown compound QBF is the only one of significance because of its presence in the majority of schizophrenic and absence in the majority of non-schizophrenic urines. Attempts to isolate the substance indicated its highly elusive nature and were not successful. Solvent partition provided a brown-yellow amorphous substance which gave strong positive GA. reactions, on chromatographic analysis gave the QFB spot, but it showed also the presence of contaminants. The substance is soluble in n-butanol, insoluble in chloroform and acetone, almost insoluble in ether and water. Its decomposition is readily effected by N/10 NaOH. It does not give reversible color reactions on bleaching by alkalies.

Indolyl acetic acid was present in seven of the 14 urines of schizophrenics and only in one of the 7 non-schizophrenic urines. The presence of other unknown compounds seems to have no significance in assessing the pattern variation of the schizophrenic against the non-schizophrenic group, either because of their infrequent appearance or their occasional presence in normal urines.

Tryptophan was found in none of the urines in amounts in excess of those occa-

[1] Based on an address presented at the Conference on "Biochemistry and Mental Disease", University of British Columbia, Vancouver, June, 1957.

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TABLE 1

Summary of Data and Analysis Described in Text

Case No.	Sex	Diagnosis	GA. test	Clinical observations	Chromatographic analysis				
					a	b	c	d	e
1	f	schizophr.	+	g, h, i	+	+	+		
2	m	"	±	g	+	+	+		
3	f	"	+	g	+	+	+	+	+
4	f	"	+	g, h	+	+	+	+	+
5	f	"	±	g, h	+	+		+	+
6	f	"	+	j		+			
7	m	"	+	g		+			
8	f	"	+	g	+	+		+	
9	f	"	+	g	+	+			
10	m	"	+	g, h	+	+			
11	m	"		j	+	+		+	
12	f	"	+	g	+	+	+	+	
13	m	"	+	g	+	+	+		
14	m	"		j	+	+	+	+	
15	f	depression	+	g	+	+	+		
16	f	manic depression	+	g	+	+		+	
17	f	melancholic.	−	g, h		+			
18	m	melancholic.	−	g, h		+			
19	f	hyster. melancholic.	+	g, h		+			
20	f	hysteria	−	j		+			
21	m	obsess. state	+	j		+		+	

a: unknown compound, Rf × 100:63 Ipram, 47 BuA; rapid blue, quickly fading.
b: Indoxyl sulphate, Rf × 100:60 Ipram, 41 BuA; orange-brown, later brown.
c: Indolyl acet. acid, Rf × 100:44 Ipram, 87 BuA; red-purple, later fades.
d: Tryptophan, Rf × 100:24 Ipram, 50 BuA; slow purple, later fades.
e: Unknown compound, Rf × 100:54 Ipram, 33 BuA; purple-blue, later fades.
g: Chlorpromazin hydrochloride (Largactil) drug therapy.
h: chronic constipation.
i: paraldehyde treatment.
j: no somatic or pharmacological treatment.

sionally present in normal urines and it is concluded that the positive GA. test among the 21 urines were not due to excessive excretion of tryptophan. The absence of 5-hydroxytryptamin from the chromatographic pattern was also noted and there was no evidence indicating that the psychoses may be connected with an accumulation and excretion of surplus serotonin.

Ultra-violet light observations, the "Fluorindal reaction" and the analysis for amino-acids revealed no significant abnormalities.

MODIFICATIONS OF THE GLYOXYLIC ACID TEST

The number of doubtful GA. test results in previous work (6) with urines of mental

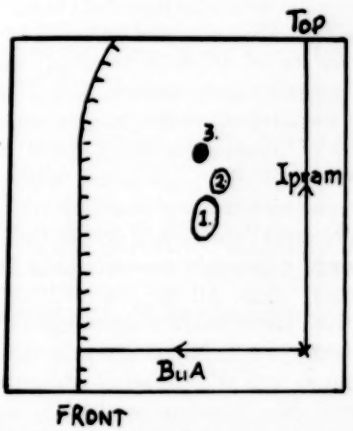

FIG. 1. Position of unknown compound on chromatogram (Rf 63 and 47 in Ipram and BuA respectively).

patients indicated the desirability of improving the sensitivity of the test on account of its possible diagnostic significance.

It was noted that urines of schizophrenics which gave positive GA. tests, ceased to react positively after butanol extraction. Use was made of this observation in modifying the standard test by adding a solvent mixture of n-butanol, glacial acetic acid-water (60:15:25) to the urine prior to the GA. test. The modification improved the clarity of the colour reaction and the sensitivity of the test and thereby facilitated the evaluation of otherwise doubtful results.

Overnight samples of urines of 50 unclassified schizophrenics, 78 non-schizophrenics and 12 healthy adults were tested by the modified method. All chemical determinations were carried out without knowledge of the clinical categories of the patients.

The following procedure was adopted. Two drops of a 2.6 per cent solution of copper sulphate in water (1) were added to 2.0 ml. of filtered urine. Then were added 0.5 ml. of the solvent mixture, made up freshly every day to avoid esterification on standing. The mixture was thoroughly shaken and allowed to stand for five minutes. After further shaking 1.0 ml. of conc. glyoxylic acid was added and the test was carried out, keeping the test tubes immersed in cold water while adding the acid (2).

From the 50 urines of schizophrenics 38 (76 per cent) gave positive and 3 (6 per cent) negative reactions. In nine cases the results of repeat tests contradicted observations made in prior tests. With non-schizophrenics the test was positive in 22 (28 per cent), negative in 38 (49 per cent) cases and differed in repeat tests in 18 (23 per cent) cases. All the control tests were negative. These results confirm earlier findings with the standard GA. test in the positive range with another set of schizophrenic patients (6). Negative results are significantly reduced, while doubtful results obtained in previous work, due to lacking clarity of the color reaction, are completely eliminated by the test modification.

The cause of contradictory results of repeat tests in both groups of patients is not known and the assumption that they may be due to variations in the aromatic excretion pattern during changing stages of illness and recovery, finds some support in recent work (5).

The greatest number of positive tests in the non-schizophrenic group were obtained with depressives, where nine out of 32 cases were positive. This, coupled with the presence of the QFB substance in chromatographic analysis in urines of two patients of this group indicates the need for a further study of depressives.

With some urines, particularly of patients on paraldehyde therapy, assessment was possible neither with the standard GA. test nor with its solvent modification, because a brown ring, appearing at the interface of the liquids, obscured the true color of the reaction. It was found that by oxidizing the interfering substances with hydrogen peroxide true readings can be obtained.

The following technique was adopted. 2.0 ml. of filtered urine were mixed with 0.4 ml. of 20 vol. hydrogen peroxide and left standing for two minutes. Thereafter the GA. test was carried out in the usual manner and assessed within two minutes upon its completion. The color, characteristic of a positive test, gradually fades away, until within 30 minutes to 2 hours the urine becomes colorless. However, the difference in the rate of oxidation of the interfering substances and of the chromogenic compound is sufficient to allow color readings before the destruction of the latter is completed.

In some instances tests which were previously negative, became in repeat tests positive with patients and normal adults who were suffering from colds and cystitis or toxemia of pregnancy (7), although the standard GA. test indicated in some cases no corresponding variation. With the disappearance of the ailment the test reverted to the original negative reaction. No explanation can be offered for this behavior;

it is possible that indigoids of the tryptochrome type, formed by the action of oxidisers on tryptophan and characterized by a red pigment in the presence of acids, condense with substituted indoles to produce chromogens of the Hopkins-Cole type (4). The peroxide thereby widens the range of the positive test and provides a more reliable interpretation than the standard GA. test in its negative range.

The presence of the unknown indolic compound, which appears to be characteristic of most urines of schizophrenics and possibly of certain organic disorders, raises the question whether it can play a part in the causation of psychotic symptoms, since its appearance does not always coincide with psychotic disorders. It is conceivable that the substance, although the result of related aromatic dysmetabolism in both groups of disorder, affects the CNS with genetically predisposed subjects in the schizophrenic group, because of its presence in excess, in terms of duration and/or quantity, possibly in connection with the schizoid constitution; while leaving the CNS apparently unaffected in the group of organic disorders, because of the limited duration of its effect or, because of the presence of only ineffective quantities of the toxic compound, or both. Thus, the presence of the unknown substance in both groups of disorders can be reconciled with mental derangements in the schizophrenic group of psychotic disorders, while being free of psychotic effects in those organic disorders, in which its presence was noted.

SUMMARY

Chromatographic analysis of urines of 21 psychotic patients for urinary indoles revealed the presence in the majority of schizophrenics of an unknown compound, which was absent from the majority of urines of non-schizophrenic mental patients.

The urines of psychotics showed on chromatographic analysis for amino acids and in the "Fluorindal reaction" no significant abnormalities.

A modification of the standard glyoxylic acid test is described. The results of the test with urines of 128 psychotic patients are evaluated. It is concluded that the modified test confirmed results previously obtained in the positive range, increased the number of negative tests with schizophrenics and added to the sensitivity of the test. It also improved the clarity of the test colors.

The effect of treatment of urines with hydrogen peroxide on the glyoxylic acid test was studied and it was found that the oxidizer eliminates the interference of non-indolic substances with the test. The effect of some organic non-psychotic disorders on the test results is noted and the implication discussed.

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PSYCHOLOGICAL IMPLICATIONS AND EFFECTS OF INSULIN THERAPY[1]

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STATEMENT OF PROBLEM

Since the introduction of insulin treatment by Sakel in 1933, it has been widely used with considerable variation in the method of administration. This extensive utilization has been based largely on the clinical improvement of hospitalized patients, and the larger statistical studies which show a decrease in length of hospitalization. Major modifications of the treatment, subcoma or ambulatory insulin, were introduced by Sargent and Craske in England (12) and Polatin *et al* (10) in the United States.

It has been postulated that a large part of the beneficial effects which psychotic patients receive from coma insulin may be due to the metabolic and psychological changes produced by insulin coma (11). Freudenberg (3) proposes that the deeper the coma the more favorable the results. The observation of complete remission in some patients who recover from prolonged comas adds weight to this belief.

Subcoma insulin treatment has a number of advantages over coma insulin. The possible risks involved are reduced considerably. Cooperativeness is more easily obtained and the patient is more amenable to psychotherapy. Fewer contraindications to treatment exist, and personnel needs are reduced. Finally, the expense of treatment per patient is less.

A survey of reported results indicates lack of uniformity and considerable disagreement regarding the comparative effectiveness of deep coma and subcoma insulin therapy. Alexander (1) suggests that in severe cases of schizophrenia, insulin subcoma is of little value except as a symptomatic sedative. Good clinical results have been reported, on the other hand, by Tomlinson (13), who considers that subcoma insulin therapy is as effective as classical coma insulin, especially when properly applied. Greaves *et al* (5) also report favorable results using subcoma insulin. Following a seven-year survey of insulin treatment in schizophrenia, Gralnick (4) suggests that the specific "insulin-treatment-situation" counts, not merely the insulin hypoglycemia. Boling *et al* (2), in a comparative study with deep and light coma treatment, found that the depth of the coma is apparently not a significant element in the therapeutic effect. They suggest the need for study of the psychological aspects of the treatment. This study was designed to compare the relative effectiveness of deep and subcoma insulin therapy in a clinical setting offering similar psychological and extra-treatment conditions.

A second aspect of the study concerned the nature of the psychological changes stemming from insulin therapy. Studies on the psychological effects of insulin treatment tend to evaluate its effectiveness largely in terms of unspecified or vaguely referent clinical data and criteria which lend themselves to idiosyncratic interpretations. Repeatability of any study is therefore difficult and cross-comparisons, either in terms of diagnosis, prognosis, or outcome, become almost meaningless. Comparison or combination of data from different studies is complicated by the problem of

[1] This investigation was carried out at the Veterans Administration Hospital, Brockton, Massachusetts. Grateful acknowledgment is made for the assistance of Libby Blek, Ph.D., Charles Taffel, Ph.D., Irving Wolf, Ph.D. and the Nursing Assistant staff of the VA Hospital.

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dealing with the individual researcher's unique approach in presenting his methods and results, since there is little standard presentation of data and evaluative criteria (1).

While there would seem to be some consensus that schizophrenic patients derive psychological benefit from insulin treatment, there is considerable variation of opinion as to the nature of the effect. Generally, it is agreed that the benefit is largely in the nature of symptom reduction. Disorders of thought, including such symptoms as perceptual distortions, conceptual disorganization, ideas of reference, hallucinations and delusions, have been found to be most responsive to this treatment (1, 6). The use of the Multidimensional Scale for Rating Psychiatric Patients (MSRPP), offered an opportunity for symptom cluster analysis and made it possible to measure, in a relatively objective fashion, the areas of psychopathology for which insulin treatment was effective (8). The latter aspect of the study, therefore, was designed to test whether schizophrenic symptoms principally are reduced in schizophrenic patients by insulin treatment.

METHODS AND PROCEDURE

Sample: Twenty-seven hospitalized schizophrenic patients selected as suitable candidates for deep coma insulin treatment were assigned randomly to either deep (N = 16) or subcoma (N = 11) treatment. The two groups were comparable with respect to age, education, and diagnosis, prior somato-therapies, chronicity and severity of illness. The tests for comparability were made using the Mann-Whitney U Test (9). Table 1 presents the diagnostic characteristics and the prior somato-therapies received by both groups. The number of prior treatments is greater than the number of patients since some patients received more than one previous treatment. The measures of chronicity consisted of the number of hospitalizations, total length of hospitalization, and length of current hospitalization. Severity of illness was measured by the pre-insulin treatment MSRPP ratings. The groups were found to be comparable on both sections of the MSRPP.

TABLE 1

Characteristics of the Deep- and Subcoma Insulin Groups

Diagnosis	Deepcoma (N = 16) No. of Patients	Subcoma (N = 11) No. of Patients
Paranoid	10	6
Catatonic	4	3
Undifferentiated	1	2
Schizoaffective	1	0
	16	11
Prior Somatotherapies	**No. of Patients**	**No. of Patients**
Electroshock	13	6
Chlorpromazine	3	7
Reserpine	2	1
Meratran	0	1
Total*	18	15

* These totals exceed the number in the sample because some patients received more than one previous treatment.

Insulin Treatment: Deepcoma insulin treatment was conducted utilizing the rapid induction method. An initial dose of 50 units of insulin was doubled daily until coma was attained. The average time found to achieve coma was found to be six to seven days. Insulin was then reduced to a leveling-off dose which consisted of the minimum dosage to reach coma within a three-hour period. The criteria for coma were the absence of a pain reaction and a positive Babinski reflex. Treatment was given five days weekly in the early morning and each patient completed treatment following 60 comas.

Subcoma treatment consisted of 60 physiological reactions which were defined as sufficient insulin to cause perspiration, weakness, somnolence, and tremulousness, roughly stage 1 status. Treatment was terminated orally, not by gavage or parenteral. Treatment was conducted five times a week

and the patient stayed in bed during the treatment hours.

Deep coma and subcoma patients received treatment in the same physical setting separated by a portable screen. They took their meals in the same dining room, participated in identical treatment activities, and were managed similarly in other psychosocial aspects of their hospital living. With the exception of the depth of treatment, *i.e.* stage 3 versus stage 1 of the classical therapy, patients had identical treatment and extra-treatment living conditions and activity programs.

The Multi-dimensional Scale for Rating Psychiatric Patients, Hospital Form, was utilized for pre- and post-treatment comparison. This rating scale offers information based on psychiatric interview and ward observations relative to the patient's symptoms and behavior. The scale consists of 62 brief, unlabeled, graphic rating scales presented in a random order. The schedule serves in a relatively objective and quantitative form as a description of the observable behavior or readily inferable traits and common symptoms of hospitalized patients. The scales represent a broad sample of important symptoms characteristic of the functional psychoses. They demand a minimum of interpretations on the part of the observer and they yield judgments relatively unbiased by the rater's point of view or theoretical persuasion (8). The MSRPP is particularly useful since it offers 11 factors or dimensions of psychopathology which consist of groups of scales which measure common psychopathological tendencies or behavioral traits. The factors, described in Table 2, may be grouped for purposes of description into those reflecting affective disorders, those indicative of schizophrenic processes, and those relating to disturbances of temperament which may be observable in non-psychotics as well as psychotic patients (8). The affective group consists of factors A and E. The schizophrenic sequence is described in terms of factors C, F, G, I, J, and K. The third group is composed of B, D, and H. Factor L, hysterical conversion, was not analyzed since the authors consider it tentative. We would predict, based on our sample of hospitalized schizophrenic patients, that those factors portraying the schizophrenic syndrome will undergo change following insulin treatment (6).

TABLE 2

Multi-Dimensional Scale for Rating Psychiatric Patients, Hospital Form, Factors

	Affective Group	Schizophrenic Group	Others
A. Retarded depression vs. manic excitement	×		
B. Compliance vs. resistiveness			×
C. Paranoid projection		×	
D. Activity level			×
E. Melancholy agitation	×		
F. Perceptual distortion		×	
G. Motor disturbances		×	
H. Submissiveness vs. belligerence			×
I. Withdrawal		×	
J. Self-depreciation vs. grandiose expansiveness		×	
K. Conceptual disorganization		×	

Two staff clinical psychologists, alternating as interviewer and observer, jointly saw each patient. The interview section of the scale was completed following a thorough interview of the patient. The ward observation section was rated by five pre-trained, experienced psychiatric aides. Pre-ratings on both criteria were obtained during the week prior to treatment, and post-ratings were obtained in the seven- to 14-day period following treatment. The reliability of the ratings was obtained as follows: the two staff clinical psychologists had zero instances of more than one point difference in ratings. They were in perfect agreement in 81 per cent of their judgments. No reliability measures were obtained on the ward ob-

servation section since the number of aides utilized in the study precluded such an opportunity.

RESULTS

I. Scoring of the MSRPP followed the method suggested by Lorr (8). The numerical value of each scale from the interview section was the mean of the interviewers' ratings. The modal rating made by the five psychiatric aides served as the ward observation numerical value. A comparison between the two insulin groups based on the pre-treatment interview and ward observations was made. The results presented in Table 3, revealed no difference between the groups on either of the MSRPP section. The post-treatment comparison results are also presented in Table 3. The obtained probability values reveal that the between-group differences could have occurred by chance. In effect, neither group changed to a significantly greater degree. The question of whether any change or improvement occurred within groups is of course crucial, and this hypothesis was tested by the pre- and post-treatment comparisons made within each treatment group. The Wilcoxon Paired Replicates Method (14) was employed and the findings are presented in Table 4. The probability values in all four instances reveal a significant difference pre- and post-treatment on both sections of the MSRPP for the deep- and subcoma groups.

TABLE 3

*Pre-Treatment and Post-Treatment Comparisons Between the Deepcoma and Subcoma Insulin Group**

	Pre-Treatment	
	Z	P
Psychiatric Interview†	.92	.36
Ward Ratings	1.46	.14
	Post-Treatment	
Psychiatric Interview	.70	.48
Ward Ratings	.59	.56

* Mann-Whitney U Test (9)

† One patient could not be interviewed before treatment, reducing the deepcoma sample to 15.

TABLE 4

*Pre-Treatment and Post-Treatment Comparisons Within the Deepcoma and Subcoma Insulin Groups**

	Deepcoma Group	Subcoma Group
Psychiatric Interview	$p < .01$	$p = .01$
Ward Ratings	$p < .01$	$p = .06$

* Wilcoxon's Paired Replicates Method (14).

TABLE 5

Clinical Results of Deep- and Subcoma Insulin Treatment

	Deepcoma (N = 16)	Subcoma (N = 11)
Passes and/or privileges	14 (88%)	9 (82%)
Discharge	8 (50%)	4 (36%)

The magnitude of change pre- and post-treatment between the deep- and subcoma groups was found to be non-significant for ward observations and interview. The Mann-Whitney U-test revealed a probability of .47 for the interview section, and .23 for the ward observations section.

The clinical results are presented in Table 5. The three-month follow-up revealed that 88 per cent of the deepcoma group and 82 per cent of the subcoma group attained the status of passes and/or grounds privileges. Hospital discharge was obtained by 50 per cent of the deepcoma group, and 36 per cent of the subcoma group. The group differences were not statistically significant.

II. Since they were found to have comparable results, the subcoma and deepcoma groups were combined. The MSRPP was analysed for 11 of the factors. The factor raw scores were obtained by adding the numerical values of the ratings on the scales descriptive of the factor. The Wilcoxon matched-pairs signed ranks test was utilized for comparing both interview scores and ward observations before and after treatment (14).

The results of the statistical analysis are presented in Table 2. Factors C (paranoid projection), F (perceptual distortion), I (withdrawal), and K (conceptual distortion) were found to be highly significant at less than the .01 level of significance. The number of factors achieving significance suggests that an explanation of our findings in terms of chance is not satisfactory.

DISCUSSION OF RESULTS

The results indicate that deepcoma and subcoma insulin treatment under controlled conditions of administration are essentially comparable. Our findings indicate that both groups showed a significant degree of improvement as measured by the MSRPP indices following treatment. From a statistical point of view there does not seem to be any difference in the extent to which the groups showed significant change pre- and post-treatment. Post-treatment clinical benefits were comparable for both groups. Thus, it would seem that the depth of coma is not a significant factor in the therapeutic effect of insulin treatment. Of the eleven factors in the MSRPP, six comprise the schizophrenic grouping, C, F, G, I, J, and K; two comprise the affective grouping,—A and E; and three comprise personality parameters characteristic of non-psychotics as well as psychotics, according to Lorr, B, D, and H. Our findings show significant improvement with insulin treatment in four of the six factors of the schizophrenic grouping, C, F, I, and K (which are related to paranoid projections, withdrawal, perceptual and conceptual distortion). A fifth factor in the grouping, G (motor disturbances), does not achieve a level of significance but shows a definite trend in that direction.

CONCLUSIONS

Our experience lends further support to the previous research which holds that subcoma is as effective as coma insulin therapy. Since the onset of this study, the use of insulin therapy has fallen off considerably and many psychiatric facilities no longer make it available. Our results indicate that frequent benefit may be obtained from subcoma levels of insulin as seen in our sample.

The clinical setting which was employed in our treatment situation offered similar psychological treatment and extra-treatment conditions; the results of the comparison of deep, and subcoma insulin point increasingly toward an explanation of insulin effectiveness which includes the psychological conditions and impact of the total treatment setting. The data do not allow any specific variables to be isolated as crucial, but indicate that further study in the area is needed in light of the extensive utilization of drug therapy. Factors such as the therapist's attitudes and feelings toward a treatment, and the treatment setting would seem to have an important bearing on treatment effectiveness. At this point, it is not possible to focus on a single or complex of factors, but among those which must be considered are the relatively constant treatment relationship involving the therapist and nursing personnel, feeding, insulin administration, bed rest and the psychological reaction to the impact of the treatment.

It is felt that the study confirms once more the effectiveness of insulin treatment in ameliorating schizophrenic symptomatology and also demonstrates the usefulness of the MSRPP in measuring the psychological effects of a somatic treatment. It is suggested that it might be of considerable value to conduct controlled clinical studies with the various tranquilizing drugs, utilizing the MSRPP as one of the main instruments to evaluate the psychological effects of this type of somatic treatment.

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CLINICAL AND PHARMACOLOGICAL STUDIES OF MARSILID[1] AND THEORETICAL CONSIDERATIONS CONCERNING ITS ANTIDEPRESSANT ACTION

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There is much disagreement about the merits of drug therapy in clinical psychiatry, yet no one can deny the fact that psychopharmacological agents have increased our knowledge of human psychopathology. Marsilid has already proven to be a particularly valuable tool in psychiatric research in that it affects a multitude of mental functions without altering the sensorium of the individual. Psychological changes in tuberculous patients who received the drug mainly for physical debilitation were reported elsewhere (10, 11, 12, 15). Since then our findings have been largely confirmed by subsequent observations on many more cases with tuberculosis and by Bateman (3) in cases of advanced cancer. The outstanding reactions in individuals who responded to the drug favorably (about 60 per cent) were changes in mood, behavior and mentation. The facial expression and general physical appearance acquired a bright, healthy quality in many patients whose disease was not too advanced. This clinical picture which was called "typical iproniazid reaction" (TIR) was the very opposite of the symptomatology presented by patients suffering from neurasthenia or depression. Since Marsilid was introduced in the therapy of mental disorders, consistently good results have been obtained in psychogenic depressions (18, 19, 27, 38, 39, 40, 44), in senile conditions (43) and certain retarded states (5, 16). The responses achieved in chronic psychotics were less satisfactory (14, 30) or negative (25) and, adverse reactions, according to certain authors (1, 49), outweighed beneficial effects. Marsilid therapy also achieved reduction of pain and other symptoms in cases of rheumatoid arthritis (41, 42), ileocolitis (7), angina pectoris (8), acne vulgaris (4), and hypertension (20, 33). The choice of the drug for the treatment of all these conditions was based on various theoretical considerations. Yet one may speculate that the diverse pharmacological effects of Marsilid have a common therapeutic denominator, if one considers that the aforementioned diseases are often classified under the heading of *psychosomatic disorders*. It is not surprising either that a drug can simultaneously affect physical and psychiatric deviations since depression and so-called psychosomatic disorders are interrelated clinically.

The writer has used Marsilid on a selected group of patients suffering from various types of psychogenic depressions and has observed changes similar to those noted in the series of tuberculous cases. Weakness, anorexia and phobic manifestations, so typical of many chronic ailments of a physical and mental nature, responded rather rapidly to the drug and were replaced by well-being, new interests and an increased capacity to sustain efforts. Furthermore, in both series of patients, the psychological changes appeared to evolve according to a well established pattern in spite of the fact that in some cases the dosage plan of the drug and the environment remained essentially the same. The following three phases were observed in typical Marsilid reactions. In the first phase, tension and depression lifted and gave way to a state of relative tranquility. In some

[1] Marsilid (iproniazid) phosphate, which chemically is l-isonicotinyl-2-isopropylhydrazine phosphate, is manufactured by Hoffmann-La Roche Inc., Nutley, New Jersey.

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patients, especially in involutional psychoses, there was a period of turbulence similar to the one described by Kline (26) in the early treatment with Reserpine, and of severe autonomic reactions. The second phase was characterized by a feeling of well being, a re-awakening of energy and a reaching out for new interests. Accompanying symptoms such as phobias, obsessive thinking, hypochondria and psychosomatic reactions began to decrease in the early part of treatment and disappeared in a few weeks if therapy was successful. The second phase changed into the third phase imperceptibly when elation, overactivity and insomnia began to appear. Typically the patient was somewhat arrogant, meddlesome, cooperated poorly and was shallow in his affect. In cases of oversensitivity to Marsilid or overdosage, a fourth phase ensued in which the psychological manifestations were frankly manic or often paranoid. While the behavior manifested in the third phase was frequently considered as an expression of mental health by the patient and persons closely associated with him, the behavior exhibited in the fourth phase was always recognized as being abnormal. The cases of Marsilid psychoses described in the early literature belonged to the latter category (50). An analysis of the above psychiatric process immediately suggests a striking similarity with the ascending stage of spontaneous recovery from a depression and the subsequent phases of hypomanic or manic behavior.

Although an increased output of energy is the most easily recognized manifestation in all stages of treatment, it is not necessarily the most significant effect from a therapeutic and theoretical point of view. Similarly tranquilization is not always the most beneficial result of treatment with Chlorpromazine, rauwolfia or other compounds commonly called "tranquilizers". Barsa (2), for instance, made the important observation that Thorazine and Reserpine had sedative as well as antipsychotic activity, two effects which were not necessarily related to each other. It is my opinion that many unnecessary debates regarding the use of new psychopharmacological agents were provoked by the designation "tranquilizers" given to these compounds. Many objections are still being raised against the use of such agents in that they allegedly dull the individual and thus lower his capacity to face the hard necessities of life. Therefore I should predict that an equally great number of objections will be raised against the use of "energizing" compounds on the ground that an individual under the influence of such an agent may be driven to expend an excess of energy in the neurotic pursuit of power and success. Hence the designation "energizer" chosen for Marsilid is an unfortunate one. It emphasizes only one aspect of its pharmacological action and thus is likely to lead to therapeutic misuse and misconception of its applications. A similar view was recently expressed by deVerteuil and Lehmann (49).

I should like now to present four case histories to clarify some of these observations.

Patient A.: This male, age 53, had a history of having been tense, irritable and extremely compulsive in his behavior for many years. The present attack probably began two years ago with a skin condition and became progressively worse during the six months prior to his seeking psychiatric help. When he was seen for the first time he exhibited the typical manifestations of a severe depression, *viz.* anorexia, insomnia, inability to concentrate and lack of energy. In addition, there were phobias and obsessions, some of which were of a bizarre nature. He received Marsilid in daily doses of 50 mgm. and this was soon increased to 100 mgm. There was a marked improvement in the fifth day of treatment, which was followed by a loosening of repressed emotions, by a "sentimental attitude" and by profuse crying. However, it took about

two months for the other symptoms to clear, the bizarre obsessions disappearing first. The patient's attitude toward his son changed from an irritable preoccupation with his shortcomings to a sympathetic understanding of the boy's real difficulties. In view of this improvement, the Marsilid dose was reduced to 50 mgm. a day. Two weeks later the patient reported that he felt better and could sleep again without a sedative. While the patient was receiving larger doses of Marsilid, he worked very effectively, but was "keyed up" at the end of the day and slept poorly. He had no insight into this state of overactivity at that time and therefore found it unnecessary to report it to the physician. The drug was discontinued gradually and the patient remained free of complaints for over eight months, the period of follow-up observation.

Patient B: This male, age 47, had three episodes of major depressions. The first episode lifted spontaneously; the second cleared in less than a week after the first signs of improvement set in. The third episode began in the early part of 1957 and was treated with ten electric shocks in March of the same year. He responded to the first EST but began to relapse a week or two after the last treatment. Marsilid administration (100 mg./day) was initiated in September, 1957, at which time the patient was extremely depressed, plagued by psychosomatic symptomatology and paralyzed by phobias. The depression lifted on the fourth day of drug treatment and most of the other symptoms disappeared during the succeeding three weeks. The decline of clinical symptomatology was accompanied by an upsurge of strong inner sensations, a pervasive feeling of sadness and a considerable insight into his interpersonal difficulties. The dosage was reduced to 50 mg. a day, but while the symptomatic improvement continued, the patient's behavior changed in the direction of excessive involvement in his work and more shallow contact with people. At the end of the second month of Marsild treatment, the patient stated that he felt as comfortable as he did in the 12 years preceding his depression and decided to discontinue medication. When the patient was in the depth of his depression he talked about that period of his life as being one of great satisfaction and efficiency. However, a more careful analysis of those years revealed the existence of considerable psychopathology such as obsessive thinking, restlessness and severe limitation in social relationships. His great feeling of inadequacy was thinly disguised by a contempt for conventional life, defiance of authority and a false sense of self-sufficiency. This clinical and psychological condition, so often encountered in mild conditions of hypomania, returned in the second or third month of drug therapy with significant exceptions which will not be discussed here. In May of 1958 there was a brief relapse which responded to Marsilid in a manner similar to that of the previous attack.

Patient C: This male, age 28, was under my care for over four years. The outstanding manifestations in this case were severe depressions which in the past had led to suicidal attempts. These depressive episodes had become less frequent and intense in the last three years, but a serious depression developed before Christmas of 1957. Marsilid (ave. daily dose 80 mg.) was administered over a period of 15 days and was discontinued mainly because of dryness of the mucosae. The acute symptomatology cleared in less than a week and a period of tranquility followed. About three weeks after Marsilid had been discontinued the patient verbalized feelings and thoughts he had never expressed before in therapy. "Now I sleep only six or seven hours; in the past I had to have nine hours of sleep and I was always tired ... People look different to me now ... I have faith in my opinions ... I have changed ... I am in the center ... In the

past I was somewhere at the periphery." A week later the patient talked about new interests but he was obviously involved in too many activities. In that particular session he sounded somewhat defensive and became quite antagonistic when he was told to use moderation in his daily activities. A few weeks later he became somewhat shallow in his affect but settled down to a more sedate type of life.

Patient D: This male, age 33, suffered from chronic schizophrenia. Following his discharge from a mental hospital in May of 1956, he had been completely disabled, withdrawn,and deteriorated in his habits. In spite of this severe form of regression, he answered questions relevantly but without any spontaneity. The patient had no concern about his state of apathy, but complained of severe headaches and ill-defined yet unbearable attacks of apprehension. Marsilid was administered in daily doses varying from 50 to 150 mg. for ten weeks and then discontinued due to neurological and vascular complications. From the very beginning of treatment, the drug effects were atypical. The patient became anorexic, lost a considerable amount of weight and felt more despressed. However he was eager to continue treatment, as he had received considerable relief from headaches and other distressing symptoms. There was little change in his behavior until he reached the second month of treatment when suddenly an entirely new picture developed. The patient became overactive, compulsive and also exhibited a variety of rituals and hoarding habits. In addition, he became argumentative, mischievous, and eager to drive his car, although heretofore he had been reluctant to leave his house for fear of meeting people. Two weeks after termination of treatment the patient was frankly paranoid and threatened to sue his therapist for having changed his personality. This acute paranoid condition, which lasted only a few days, changed to a hypomanic state which persisted for several weeks although Marsilid had been withdrawn two months before. In the period of greatest turbulence the patient was extremely sensitive to rejection, cried very easily and became very attached to his younger son. This increased sensitivity and affectivity disappeared as the hypomanic condition set in. Three to four months after Marsilid therapy was terminated and all physical complications had subsided most psychiatric symptoms and headaches returned. Nevertheless some psychological gains, such as neatness and interest in music, were retained.

DISCUSSION

The behavior and emotional manifestations exhibited by the four patients followed the psychodynamic process outlined earlier and thus resembled the changes which spontaneously occur in the course of affective disorders. However, the end results of therapy varied. Patient A achieved a new mental balance which was stable enough to suggest a complete remission. Cases B and C reached an adjustment which was far superior to the mental state prior to treatment; this equilibrium, however, lacked the intense feeling tone so characteristic of the early phases of therapy. The last patient displayed extensive fluctuations in mood and behavior, but was unable to reach a mental balance approximating clinical improvement.

Psychic changes occurred quite early in treatment, but in patients C and D the most significant effects became evident several weeks after the drug was withdrawn. These delayed reactions may be attributed to a slow readjustment of enzymatic and endocrine activities following the elimination of the pharmacological agent from the organism. Chemical studies now in progress lend some support to this possibility. In the light of these observations it is legitimate to assume: 1. that Marsilid creates a radical change in the mental equilibrium, probably early in therapy; 2. that a series of chain reactions develop once this change has oc-

curred; and 3. that in patients who respond to treatment successfully, a new and more stable equilibrium is achieved.

The patients of this brief series became more productive and showed greater resistance to fatigue in the course of Marsilid therapy and, except for patient D, made more effective use of their judgment and potentialities. On the other hand, they did not use their resources constructively in all stages of therapy, although they seemed to be satisfied with their performance. Consequently the patient's output of energy could not be used as a reliable criterion of drug effectiveness. On the other hand, a change in affectivity and awareness seemed to be the outstanding feature in Marsilid therapy.

The elevated feeling tone, vividly experienced by three patients in this series and by others reported elsewhere, eludes an accurate description since it has a nondescript familiarity similar to early childhood emotions. The re-awakening of interests is generalized and diffused before it becomes goal-directed. In conclusion, it is my opinion that the greatest value of Marsilid lies in the drug's ability to facilitate the individual's reactivity to sensations of various types (13).

THEORETICAL CONSIDERATIONS

What is the nature of Marsilid action in depressions? Unfortunately this question will not receive an adequate answer as long as the basic pathology of depressions is so poorly understood. In his well documented studies Kraines (28, 29) emphasizes the importance of physiological disturbances in the pathogenesis of manic-depressive psychoses on the ground that the disease often occurs in the absence of precipitating factors and may be effectively treated with a physical agent like EST.[3] The *fact that a chemical substance*, such as Marsilid, can also be effective in depressions gives additional support to a physiological etiology of such conditions. The physical and mental responses to Marsilid indeed resemble the correction of a severe metabolic disorder.

It is not within the scope of this paper to elaborate on the biochemical and physiological effects of Marsilid. However, a few theoretical considerations in regard to the site of drug action are relevant to this discussion. Marsilid became an important tool in psychopharmacological research when Zeller and his associates (51) discovered that the drug is a powerful inhibitor of amine-oxidase, one of the key enzymes of neuro-humoral metabolism. Since this important discovery was made, considerable experimental evidence (32, 35, 46, 47, 48, 52) has already proven that at least some pharmacological effects of Marsilid are caused by changes in the concentration of serotonin and catecholamines (36) in strategic areas of the central nervous system. Marsilid, like Reserpine and Thorazine, seems to be most active on subcortical structures, particularly on the hypothalamus. Evidence regarding this site of action was given by a recent and most ingenious experiment by Olds and Olds (34) and by the fact that the concentration of serotonin and catecholamines is higher in these areas than in other parts of the brain (23). Moreover the psycho-physiological reactions to the drug in humans offer additional support to this thesis. Changes in appetite, in sleep requirements and in autonomic balance, commonly observed during Marsilid treatment, and, possibly, effects on psychosomatic diseases may be explained in terms of drug action on specific functional areas located in the diencephalon. Likewise, the increase of physical and psychological awareness may be ascribed to an activation of a well defined subcortical system, namely the central reticular formation, "where all sensory modalities make connections" (Magoun, (31)). In other words the undifferentiated, non-

[3] Some authors (38, 40) think that Marsilid will replace EST in the future. It is noteworthy that patient B achieved a rapid reversal of depressed symptomatology with EST, with Marsilid, as well as in the absence of any drug or physical therapy.

objectified sensations reported by the patients may be the result of drug action on this important system of visceral and sensory organization. It is conceivable, then, that Marsilid's action on the central reticular formation also corrects the intellectual impairment which always accompanies depressed moods.

Depressed individuals are isolated from inner experiences and from the world by endogenous factors. This situation is aggravated by their limited human contacts and by the scarcity of stimulation from their environment. Self-absorption, inner emptiness and lack of meaningful relationships, the most common manifestations in depression, are the expression of sensory deprivation and emotional impoverishment. Furthermore, the thoughts of depressed patients are repetitious, obsessive and fixated on a few ideas. In other words, their mental activities resemble the experimental situations of sensory deprivation and of exposure to monotonous stimulation (21, 22, 45) which were designed to produce the so-called "isolation psychoses". One of the main functions of psychotherapy is to provide new stimulating experiences for individuals whose thoughts and behavior are impoverished and stereotyped. It is a common experience for a psychiatrist to observe a depressed patient repeat his complaints in a monotonous fashion until he becomes mute or completely disorganized. On the other hand the patient may recover from his obsessions and other mental disturbance, if the psychiatrist offers a meaningful suggestion, a soothing remark or a sound interpretation. Similarly and perhaps with greater predictability a pharmacological agent, like Marsilid, may correct intellectual aberrations by raising the inflow of sensations and increasing the randomness of stimulation. Psychotherapy and psychopharmacology, two entirely different procedures, may have a similar therapeutic denominator and ultimately achieve the same results.

An increase of emotions is therapeutic in depressions but may also lead to an overcorrection of neurological functions and to homeostatic imbalance. These two effects in addition to drug toxicity[4] are likely to limit a wider use of Marsilid in psychiatry. The drug action is on widespread areas of the brain which may not be equally affected by the same neuro-humoral disorder. This may lead to the correction of a function in one area and overcorrection in another. Excessive gain of weight, hypotension, ataxia, insomnia would be examples of abnormal drug action on certain centers; yet some of these disturbances cannot be eliminated without reducing the effectiveness of the drug. The greatest therapeutic problem, however, is the maintenance of a satisfactory mental balance after a reversal of the depressive process is achieved. It is difficult to prevent or even recognize the development of a hypomanic state since the patient is so eager "to feel so wonderful" and to function effectively. Yet the healthy vitality, characteristic of the early phases of therapy, cannot be recaptured so easily once detachment, shallowness of effect and overactivity set in.

This hypomanic behavior, so frequently observed during Marsilid therapy, is, in all likelihood, caused by a disturbance in centers of complex neural integration. One may speculate, for instance, that the opening of healthy pathways in the area of affectivity causes a stressful situation in structures unprepared to cope with an excessive inflow of afferent impulses. This disturbance would then initiate a series of readjustments and finally create an equilibrium which would be less satisfactory but better attuned to the total organization of the individual.

[4] Untoward reactions to Marsilid, especially liver damage, have received a considerable amount of adverse publicity in recent months. However, due to the nature of this paper and lack of space drug toxicity will not be discussed here.

CONCLUSION

Whatever the results of future experience with Marsilid, there is already convincing evidence that this agent has the capacity to correct physiological disturbances in depression. As a consequence of this action visceral and sensory functions become more effectively integrated and at the same time a greater range of affective stimulation is made available to the patient. Since Marsilid action on depressions transcends diagnostic boundaries, it is conceivable that one basic physiological disturbance underlies many, if not all, forms of depressions, regardless of their etiology. Other interpretations cannot be excluded nor are antidepressant effects unique to the pharmacology of Marsilid. At this point, I only wish to state that an imbalance of central regulatory mechanisms may be the primary cause of certain mental and bodily disorders and, therefore, the correction of this imbalance is essential for the welfare, both psychic and physical, of the patient. The importance of vegetative regulation on the emotional life and more complex psychic manifestations was emphasized by Hoch (24). Likewise Rioch (37) stated that "highly differential functions can be carried out only if the brain stem integrative functions are stable." Another eminent scientist, Ernest Gellhorn (17) suggested that "cortical processes which determine behavior are fundamentally altered in the balance of autonomic centers", and that "the most important field of preventive psychiatry may benefit from the study of autonomic disturbances discovered in persons in whom neuropsychiatric disorders are not yet manifest". In conclusion, clinical and experimental evidence strongly suggest that a functional imbalance of subcortical centers is the primary cause of depressions and allied mental aberrations. It is legitimate, then, to assume that the use of an agent, like Marsilid, which can correct such an imbalance, is the most rational procedure in the treatment of mental depressions and is not merely an adjunct to other psychotherapeutic approaches.

SUMMARY

1. Marsilid is an antidepressant agent and is active in psychogenic depressions, in depressions caused by chronic physical illness, and in so-called psychosomatic disorders. This drug action suggests the possibility of a common pathological denominator in all these conditions.

2. The following three stages are typical of Marsilid therapy. a. Lessening of tension, depression and accompanying symptoms; b. Well-being, increase of interests and energy; c. Elation, overactivity and shallow affect. This pharmacodynamic process may occur in the treatment or post-treatment period.

3. An attempt was made to offer a comprehensive interpretation of Marsilid action. It was hypothesized: a. that certain autonomic and affective reactions are the result of a specific action on subcortical centers; b. that behavioral and affective changes are related to an increased input of sensations.

4. The use of the drug is limited by its toxicity, its widespread action on the brain and by the difficulty of achieving a satisfactory psychophysiological homeostasis.

5. It was hypothesized that the drug's value lies in its ability to correct neurohumoral imbalance. Due to this action the effect of Marsilid on depressions and allied conditions is corrective and not symptomatic.

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THE SCHIZOPHRENIC'S VULNERABILITY TO THE THERAPIST'S UNCONSCIOUS PROCESSES[1]

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After several years of doing intensive psychotherapy with schizophrenic patients, I began to realize that schizophrenic experience and behavior consists, surprisingly frequently, in the patient's responding to other persons' unconscious processes. I had long been aware of the tremendous importance of *projection* in these patient's illnesses; but I was slower to see the great—perhaps equally tremendous—part which *introjection* plays, too, in schizophrenia and, hence, in the psychotherapy of schizophrenia. On theoretical grounds one can readily think, concerning any patient whose ego-boundaries are so incomplete as to facilitate massive projection, that by the same token he will be profoundly susceptible, also, to introjection. But in actual clinical work, introjection is a process which is in most instances much more subtle, much less conspicuously displayed, than is projection, and its detection in the arena of the therapeutic relationship tends to call for a higher degree of self-awareness in the therapist than the noticing of the patient's projection generally requires.

The schizophrenic patient's so-frequent delusion of being magically "influenced" by outside forces (radar, electricity, or what-not) is rooted partially in the fact of his responding to unconscious processes in persons about him—persons who, being unaware of these processes, will not and can not help him to realize that the "influence" comes from a non-magical, interpersonal source.

For two reasons I shall limit this study to an examination of the impact of the *therapist's* unconscious impulses and attitudes upon the schizophrenic patient. First, it is in the setting of the therapeutic relationship that I as a therapist have had my best opportunities to see this mechanism operating. Secondly, no matter how greatly this mechanism pervades a patient's relationships with all other persons, it must be regarded as having especially crucial significance when it occurs in the therapeutic relationship, both because this relationship is of unparalleled importance in the patient's current experience, and because it is essential that the therapist, and eventually the patient, become as aware as possible of the forces at work in their therapeutic investigation. The potential influence, for good or ill, of the therapist's personality upon the schizophrenic patient is even more awesome than that of the analyst in relation to the neurotic patient; hence it is especially incumbent upon the therapist, here, to be as fully aware as possible of the processes at work in him, and of their impact upon the patient.

I shall not attempt to trace out the presumable countertransference element in these unconscious processes in the therapist; rather, I wish only to show various of the *effects* which they have upon the patient's subjective experience and outward behavior. The data I shall present derive solely from the psychotherapy of schizophrenia; but my experience with non-schizophrenic patients has led me to surmise that the relatively dramatic phenomena to be presented here have analogues, less dramatic and less easily detectable but of much importance nonetheless, in other varieties of psychiatric illness. In short, I surmise that it is in the *therapist's* relationship with a *schizophrenic* patient that he can see most readily certain introjective processes which are ac-

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tually at work, in some form or other, in *any* relationship involving a patient with any type of neurotic or psychotic illness.

SURVEY OF RELEVANT LITERATURE

In psychoanalytic literature, it is in papers concerning countertransference, of course, that the analyst's unconscious processes have been described, and in actuality this whole vast segment of the literature is relevant to my present subject, a segment which had its historical point of origin in a paper by Freud (8) in 1910, in which he wrote, "... We have begun to consider the 'counter-transference', which arises in the physician as a result of the patient's influence on his unconscious feelings, and have nearly come to the point of requiring the physician to recognize and overcome this countertransference in himself...."

From the subsequent flow of papers concerning countertransference in the analysis of neurotic patients, three recent articles are of greatest relevance here. In 1951, Little (14) noted that "... Unconsciously we may exploit a patient's illness for our own purposes, both libidinal and aggressive, and he will quickly respond to this."

In 1957, Schroff (16) gave an account of the analysis of a man with a character disorder of which sexual acting out was a prominent feature. He mentioned that, during a period of treatment with an earlier therapist, the man had acted out some of the therapist's unconscious impulses; and Schroff found, in his own work with the patient, that his countertransference problems influenced unfavorably the man's acting out, until late in the eventually successful analysis. This kind of mechanism, incidentally, had been described in a paper in 1952 by Johnson and Szurek (12), in which these authors reported their finding of children's acting out the parents' unconscious antisocial impulses. Barchilon (3), in a paper in 1957 concerning "countertransference cures", reported a number of examples of analytic "cures" which he showed to be based precariously upon not only transference but also countertransference, and he commented that "In more extreme cases, the therapist forces the patient to act out his own unconscious solutions with little relevance to the patient's needs...."

Turning now to the literature concerning schizophrenia, we find many papers which have emphasized the schizophrenic's powerful tendency toward incorporation or introjection[3]; a tendency which renders him vulnerable to the kind of phenomena which I shall describe. A few examples of such papers, concerning incorporation or introjection in schizophrenia, are those by Nunberg (15) in 1921, Abraham (1) in 1927, Bychowski (5) in 1930, and Allen (2) in 1935. In 1945, Fenichel (7) commented that "... it is possible to demonstrate in persons suffering from delusions of persecution the presence of the pregenital aim of incorporation which was the undifferentiated forerunner of both love and hate. Projection as such is based on a vagueness of the borderline between ego and nonego. Ideas of incorporation also correspond to this vagueness. The incorporated object has become a part of the subject's ego ..."

Hill (10) in 1955, in his volume, *Psychotherapeutic Intervention in Schizophrenia*, described the parent's unconscious as playing an integral role in the development of schizophrenia in the child. Hill stressed the etiological importance of what one might call the introjection, into the child's superego, of the mother whose own personality-integration is under severe assault from her unconscious affects: "... [The patient's] life has been severely restricted, limited, and invaded by the requirements of his parents' conscious and unconscious conflicts and drives. Anything in the unconscious of the

[3] In this paper the terms "incorporation" and "unconscious identification" will be regarded as synonymous with the term "introjection". If these three terms refer to different psychodynamic processes, I have failed, despite careful perusal of the literature concerning them, to discern any such differences.

parent which would produce anxiety must become a preoccupation of the patient in order to keep down parental anxiety and thereby reduce his own distress. . . ."[4]

". . . one meaning of the futility of the dependence-independence struggle of the schizophrenic . . . is his belief, based upon his observations, that, if he should improve and become well . . . , his mother would become psychotic. . . ."[5]

[Concerning "the mother as a presence in the superego" of the patient—] ". . . his superego is to him a very real person within him, who not only advises and threatens or opposes but actually dominates his life with crippling restrictions and interdictions supported by the threat that the superego itself will go crazy. . . ."[6]

". . . there is danger constantly of invasion of primitive superego demands which will disorganize the ego into a psychosis. . . ."[7]

Limentani (13), in a paper in 1956 concerning symbiotic identification in schizophrenia, made, in passing, the following reference to a patient's sensitivity to his therapist's unconscious processes: ". . . Richard was so keenly aware of his therapist's mood and reproduced it so closely that the therapist at times gained, from the interviews with the patient, awareness of how he himself felt."

Also in 1956, Bowen (4), in a preliminary report concerning his findings in a research project involving concomitant psychotherapy of schizophrenic patients and their parents, with the latter being housed on the hospital ward with their children, likewise portrayed the schizophrenic's vulnerability to the parent's unconscious affects: "The more we have worked with these family groups at close range, the more we can see the interchangeability of anxiety and symptoms. When we hear a mother express a worry about something that is outside the local setting, and when we get some feel of the intensity of the mother's worry with no expression of the worry in the mother, but at the very same time we see the patient's psychosis increase, it makes us more and more inclined to believe that schizophrenia is a process that exists within the family constellation rather than a problem in the patient alone."

In a paper in 1951 concerning various manifestations of incorporation (which I am here terming introjection) in the therapeutic relationship, I described a number of instances in which mutual incorporation was found to be present; one of these examples was from my work with a schizophrenic patient (17). In a paper in 1955 I pointed out that the schizophrenic's fear that he will lose his identity if he comes too close, emotionally, to another person, is a realistic fear insofar as he utilizes the mechanism of unconscious identification with (*i.e.*, introjection of) the other person as a means of keeping out of awareness the anxiety-laden affects which interpersonal closeness stimulates in him (18). And in a paper in 1957 I presented the concept that one significant factor in the causation, and maintenance, of schizophrenia in any given individual consists in the impact upon him of other persons' efforts—largely or wholly unconscious efforts—to drive him "crazy". In support of this concept I presented data from patients' intrafamilial relationships, ward-group relationships, and intensive psychotherapeutic relationships; and I reported the finding that the motivation of the other person, who integrates with the patient in such a fashion, seems most often to consist in an unconscious desire to maintain a symbiotic relatedness with him (20).

CLINICAL MATERIAL

There now follow clinical data illustrative of three different ways in which a patient may respond to the therapist's unconscious processes. The patient may (a) experience the therapist's unconscious proc-

[4] Reference No. 10, p. 53.
[5] Reference No. 10, p. 127.
[6] Reference No. 10, p. 156.
[7] Reference No. 10, p. 153.

esses as being facets of his own personality; or (b) experience them in the form of hallucinations; or (c) compulsively act them out in behavior which he himself finds incomprehensible.

THE PATIENT'S EXPERIENCING THE THERAPIST'S UNCONSCIOUS PROCESSES AS BEING FACETS OF HIS OWN PERSONALITY

In illustrating this first phenomenon material from only one therapist-patient relationship will be presented, because it is essentially the same phenomenon, I think, as that which one finds so commonly and characteristically in depressive states. I present it here solely because I have realized only recently how frequently this can be detected among schizophrenic patients also. With these latter patients, *projection* is so conspicuous that one may fail to detect the more subtle, but perhaps equally important, place of this type of *introjection* among the patient's psychotic defenses.

Three months ago I began working with a 26 year old schizophrenic woman whose previous therapist had left the Chestnut Lodge staff. I had seen this woman, in passing, innumerable times in the course of her several years' stay here, and had always thought of her behavior as outstandingly dominated by paranoid projection. She made almost incessant accusations, to myself and other passers-by, of this sort: "I know what you're thinking! You're thinking that I shouldn't have drunk that coffee at 2 p.m. yesterday," or "I know what you're going to say—you're going to say that I should have visited longer with my aunt over the telephone last week." She would go, actually, into endless detail, and with innumerable variations, quite unwittingly displaying before the public eye the most private areas of her own unconscious, in this projected form. And in her psychotherapy with my predecessor, she evidenced projection in a similarly prominent fashion, as I learned from him in my capacity as supervisor during about 18 months of their work together.

It therefore came as a great surprise to me, when I began having therapeutic sessions with her, to find that although her long-known projection continued to be prominent, there were fascinatingly subtle evidences that introjection was at work with something like equal frequency.

Thus far in the work with her I have not found this operative with respect to truly *unconscious* processes in myself, the kind of processes with which this paper is especially concerned, although I have little doubt that the future course of our work will bring to light such connections. What I have found, rather, have been dozens of evidences of her introjecting aspects of myself which were preconscious in me at the moment and readily accessible to my consciousness. Had they not been so, I could not so quickly have discerned the fact of her introjecting them.

For example, in one of the first week's sessions, as she was prattling on in a self-depreciating and rather absent-minded fashion, I took my ease by tilting my head over, at a sharp angle, against the wall. She continued rambling on, but apparently taking in, with her eyes, this shift in my posture; one of the features of her behavior which had impressed me during these early sessions was her apparently taking sharp visual note of every least little thing about my appearance and bodily movements, but never making any verbal comments about these—never expressing any opinions about, or direct reactions to, them. In this instance, what I heard within a few seconds, in the midst of her prattling, was, "I know I looked awkward on the tennis court," whereupon it occurred to me that this unusual, head-tilted posture of mine might well look awkward to her. In another session soon thereafter, the day was so hot that I removed my coat and loosened my tie; within a few seconds I heard, in the midst of her

self-critical prattle, the statement, " I'm a very slovenly person." Thereupon I realized that in the eyes of this woman who had come from a highly genteel background and even in her illness was generally neatly-groomed, I might well appear slovenly, sitting there in shirt sleeves and loosened necktie. But the fascinating thing was that she evidently genuinely experienced these traits as being aspects of herself and was quite unable to perceive them as traits of mine. I had already heard from her, within these first few hours, enough about her relationships with her parents to surmise that she had had to largely repress any critical feelings experienced toward either of her parents, both being persons with unresilient and defensive character-structures, during her upbringing.

One might look at it that, in each of these instances I have described, this woman reacted, in keeping with her low self-esteem and intense self-criticism, to my actions as being non-verbal communications to her, communications designed to convey to her my opinion that she was awkward and slovenly. This would be a quite true viewpoint, I think, but would not negate the fact of her genuinely introjecting these behavior-traits of mine. Incidentally, it should be noted that what she introjected were, apparently, not only my behavior-traits themselves, but, even more clearly, my preconsciously *low opinion of* these behavior-traits in myself. This I regard as an example of one of the mechanisms by which the schizophrenic patient expresses his unconscious endeavor to relieve the parent's own anxiety—by, namely, introjecting the parent's intrapsychic conflicts.

In subsequent hours, I found her to be referring to herself variously as "smug", "swaggering", "blah", "sleepy", and so on, at times when, I realized after hearing her say each of these things, that I was feeling thus and that I was no doubt appearing thus to her, but so appearing at a level of perception which was unconscious in her. It was evident that at a conscious level she genuinely perceived only *herself* as being thus-and-so, as, to be sure, she indeed was at times; but she seemed quite unable to perceive, consciously, that *I too* was being smug (or what-not), and being so, oftentimes, when she showed nothing in her demeanor which would warrant her self-accusation along this line.

Perhaps partly as a result of my perceiving this tendency toward introjection on her part, and my therefore encouraging her to experience, and express, critical feelings to me as these became roused in her by the things I said and did, it required only a few weeks for her to begin expressing annoyance to me about my looking smug, or "blah", or what-not, at times when I was indeed feeling so. The relative ease with which this introjective mechanism could be relinquished suggests that her perception of these various behavior-traits of mine had been taking place at, actually, a preconscious rather than fully unconscious level. And this consideration ties in with my general impression that this particular type of introjective phenomenon, which I have just described, is found in schizophrenic patients whose ego-functioning is at least somewhat more intact than that of the patients who manifest the other two types of introjective phenomena which I shall illustrate. These latter, more deeply disorganized patients leave one with little doubt that these phenomena are taking place in them at a deeply unconscious level—deepest of all, I believe, as regards the third type of phenomenon to be described.

Before going on to the second type of phenomenon, however, let me call attention to the general point, touched upon at the beginning of this paper, that—as can be seen in the brief data already given—introjective phenomena are less easily perceptible, and their detection calls for a higher degree of self-awareness in the therapist,

than is the case with projective phenomena. A simple example will point up this contrast. If a patient looks suspiciously at the therapist and says with hostility, " I know what you're thinking—you're just figuring out a way to kill me!", and if this comes at a time when the therapist has no such thought or feeling in his awareness, he is at once alerted to the possibility that the patient is *projecting* some murderous intent upon him. But if a patient says, instead, with the self-disparagement that one finds so frequently among schizophrenic patients, "I'm just a fat slob who can't even speak English!", it takes a bit of doing for the therapist, who probably at the moment is not having the thought that he himself is a fat slob who doesn't speak English in any outstandingly cultured way, to let his own trend of thought open up to just this rather unpleasantly jolting new reflection: namely, that much as he prefers to view himself otherwise, he *is* somewhat corpulent and his use of grammar *isn't* the best. Not until the therapist has traversed this relatively roundabout and difficult path does the thought occur to him, now, that *introjection* may have been involved in the statement which the patient has just made.

THE PATIENT'S EXPERIENCING THE THERAPIST'S UNCONSCIOUS PROCESSES IN THE FORM OF HALLUCINATIONS

Until about one year ago I considered hallucinations to be, without exception, essentially projective phenomena. That is, I found that my clinical experience substantiated the usual textbook descriptions of them as being due to projection. I refer, here, to such descriptions as the following one by Fenichel (7): of hallucinations he says that "... Inner factors are projected and experienced as if they were external perceptions...."[8]

But in the course of my work with a certain schizophrenic man I discovered that, in at least some instances, to understand why a patient is hallucinating we must see this as having to do with not only *pro*jection but also *intro*jection. To be specific, in this particular instance I found that the patient's evident hallucinating of murderously threatening figures connoted not only his projecting, in the form of hallucinatory figures, his own unconscious murderous impulses, but connoted also his struggle against the introjection of *my* own unconscious murderous impulses toward him.

A 32 year old man, he had been hospitalized constantly for nearly ten years (including a five year stay at another hospital prior to his admission to the Lodge), and had had nearly five years of intensive psychotherapy with a succession of therapists, before I undertook therapy with him. He proved, soon after I had begun seeing him, to be a most intensely frustrating and threatening person. For about two and one-half years his behavior during my sessions with him was limited almost exclusively to (a) sitting in slovenly torpor, dropping cigarette ashes on my rug, picking his nose and wiping the yield therefrom upon his trousers, and making no sound except for belches and the extremely frequent and quite unrepentantly loud passage of flatus; and (b) infrequent vitriolic outbursts at me, in which he would give every evidence of being barely able to restrain himself from attacking me physically, and would say such things as, "You black, slimy son of a bitch! Shut up or I'll knock your teeth out!" As the months wore on, I felt under increasing strain because of his massive resistance to psychotherapy, and increasingly afraid of his tenuously-controlled rage. There were many evidences, which need not be detailed here, that his rage was largely dissociated; so I had reason to feel that this man, who outweighed me by at least twenty pounds, had a great deal of rage which neither I, nor he himself, could reliably contain.

Meanwhile, he had evidently begun to respond to hallucinatory voices, both in

[8] Reference No. 11, p. 425.

his daily life on the ward and, at times, during his psychotherapeutic sessions. For several months, he gave every indication, in the content and tone of his responses to them, that these were contemptuous, taunting voices; he would talk back to them in a furiously angry way. Only in retrospect did it occur to me that maybe these hallucinations had some connection with the contempt which had developed in me toward him, contempt which in that phase of our work remained in an unconscious, dissociated state in me, erupting into my awareness only at brief moments with an intensity which I found shocking. For example, once when I saw him passing through the far end of the corridor I had a startlingly new thought and feeling, about this man whom I had been consciously regarding predominantly as a desperately suffering, psychotic individual, no matter how discouragingly and frightening so. My thought was, "There goes that crazy son of a bitch!", accompanied by a most intense feeling of contempt toward him.

During still later months in this two and one-half year period, it seemed that the hallucinatory figures to which he frequently responded were predominantly frightening ones; his responses to them were not so much angry as frightenedly defiant, as if he were trying to keep his courage mustered in the face of them. In one of the sessions, while I was feeling, as usual, more intensely "strained" than anything else, I noticed that as he came in and sat down he said to himself in a hushed, quavering, very frightened voice, "Careful!", as if he sensed an ominous presence in the room. It was only a few sessions after this that an incident occurred which showed me how much dissociated rage there had been in me, presumably for a long time, and presumably fostered by my having been laboring under so much discouragement and, still, threat of physical injury for so long. In this particular session to which I now refer, he had been leafing through one of the magazines from a nearby end-table in my office, as he had taken to doing occasionally, with my whole-hearted approval. But after finishing with it he tossed it desultorily toward my couch; it fell short and lay on the floor. At the end of the hour, he left without bothering to pick it up. As he was walking out the door I stooped down to pick up the magazine, still feeling only a sense of great strain. But as I lifted it up I suddenly became overwhelmed with fury, and smashed the magazine down onto the end-table with all my strength, sending a glass ash tray flying. It was at this moment that I realized the probability that he had long been sensing, and responding hallucinatorily to, this rage in me which had been dissociated heretofore.

It required several more months for me to become accustomed to feeling such an intensity of rage toward him; meanwhile, over this several-months' period, this feeling would come into my awareness only fleetingly and then return, presumably, to an unconscious level. One of these subsequent occasions of my momentarily-increased awareness involved a magazine again. When, this time, he slung one of my more prized magazines into a nearby chair, rumpling and tearing it somewhat with the force of the throw, I found myself saying to him in a balefully threatening, even tone, "Go easy on the magazines. You're not in a pig-pen." On another occasion when he had been contributing to the session naught but occasional belches and flatus and a kind of insolently-contented appearance, and he now took out a cellophane-wrapped package of crackers and ate them, it was at the point when he nonchalantly tossed the cellophane onto the floor that I found myself filled with quick fury and said, "Listen!—Don't do that in my office! Don't throw paper on my floor!", at which he looked flustered and immediately picked up the cellophane. On another occasion, when I was discussing his psychotherapy with a number of colleagues in a seminar, telling

them that I had recently begun sitting over in a corner away from the door so that he would have ready access to the door in case he became terrified of his murderous rage toward me, I realized that I had been unconsciously maneuvering the seating arrangement so that, in case he attacked me physically, I would now have a legitimate excuse—since I would now be unable to get to the door—to enter into a knock-down-drag-out fist fight with him for which, I now knew, I had been yearning for weeks. And it was within a few days of this time that when someone asked me, at lunch, how this patient was getting along, I found myself grating, "Well, he's alive, and that's not doing badly, considering how I feel toward him." More than once I had felt lucky to get out of our sessions alive; but I had not realized before that he could be looked upon as being fortunate in this same sense.

The most memorable of these incidents when this usually-dissociated rage came into my awareness was when, one night, I dreamed that he and I were fighting, and I was reacting to him as being—as I in waking life was then considering him to be—a dangerous, uncontrollable person. In the course of this dream-struggle he got his hands on a knifelike letter-opener. But what then happened, as I was astonished to recall upon awakening, was that *he* took *me* into custody; he, functioning as a kind of sheriff's deputy, was marching me out to turn me over to the authorities when the dream ended. Upon awakening I realized that my chronic fear of his attacking me was based, in part, upon a fear of my own largely-dissociated and therefore poorly controlled rage. On the following day this instructive dream yielded good dividends: when, while sitting in an upholstered chair in my office, he suddenly passed flatus of an unusually gurgling sort, I was able to have, with no attendant anxiety, this furious thought, "You son of a bitch, if you shit in that chair I'll massacre you!"

It was both fascinating to me in a research sense, and deeply gratifying to me as a therapist, to find that, by the end of two and one-half years of both his, and my own, becoming more fully and consistently aware of our respective feelings of intense contempt and rage, his hallucinating had now all but disappeared from our sessions together. One way of describing what had happened is to say that my increasing recognition, and acceptance, of my own feelings of contempt and rage toward him served to arm me sufficiently so that I could step in and interact with him at the furiously vitriolic level at which he had often "interacted" with his hallucinations, previously, while I had sat by, paralyzed with anxiety at the extraordinarily intense rage and contempt which his behavior was arousing in me at an unconscious level. I had come to realize that it actually relieved me greatly when he would shunt the most intense portion of his rage, for example, off to one side, toward an hallucinatory figure, and would disclaim that he was having any such feeling toward me. But there came a certain memorable session in which I felt sufficiently furious about what was going on, and sufficiently sure of my ability to meet both my own rage and his, so that I was able to step into the shoes, as it were, of the hallucinatory figure or figures at whom he was directing his greatest fury, and from that day on it was as though there were less and less "need" for these hallucinatory figures in our interaction with one another. What I did, specifically, in that crucial session was to insist, with unyielding fury—despite his enraged threats to assault me—that these vitriolic tirades, such as he had just now been ventilating while denying repeatedly that they were meant for me, were really directed toward me.

Midway in all this long development, it occurred to me that the emotional wavelength, or level of "interaction", upon which he participated with the hallucinatory figure(s) provided me with a clue as to the

level at which he needed for *me* as his therapist to be interacting with him; namely, this same level of vitriolic contempt and rage. I still feel that this was true enough, and that this can be looked upon as a valid general principle in one's therapy with a patient who is hallucinating. But during the subsequent months of this development which I have described, I realized in retrospect that I *already had been* participating with him at this emotional level, but had been dissociating my feelings which were invested at this level of interaction.

Subsequent to my experience with this man, I have seen a number of times this same mechanism at work in patients' hallucinatory experiences. I shall mention briefly only two of these additional examples. One of these occurred in the course of my work with a 35 year old woman suffering from paranoid schizophrenia, a woman who for years—even before I became her therapist—had been indicating, frequently, her involvement in an hallucinatory experience of being raped and impregnated; pregnancy she considered to take place not in the uterus but in the "stomach". I came to see in retrospect, during my own work with her, that this experience of hers bore quite possible correlations with my then-dissociated desires to impregnate her. The likelihood of this came to my attention when the following two events occurred in close sequence. (1) In one of our sessions, in which she was not being her usual antagonistic self, but in which there was, rather, predominantly a feeling-tone in the hour which I experienced as mutual, warm friendliness, with considerable sexual undertones, she suddenly looked anxious and demanded, insistently, "Did you just put something from your stomach into my stomach? *Did* you?" I reacted—correctly, I think—to this question as being equivalent to, "Did you just impregnate me?", and her anxiety was so great that, rather than making an analytically investigative response, I assured her flatly and simply that I had not. (2) But only a relatively few nights thereafter, I had a dream in which I was impregnating her. Prior to this I had been unaware of this specific desire toward her, although I had felt many times before, in response to her frequently seductive behavior, an erotic urge in which this specifically reproductive aim did not show itself. I can not, of course, prove that her subjective impregnation-experience was indeed in part a reaction to such dissociated desires in myself. But it is my impression that there was such a connection, and I am quite ready to believe that her similar experiences in past years, prior to my own work with her, had involved similar links with dissociated processes in other persons who at that time were important to her.

The third, and final, example is from my supervisory work with a therapist who was undergoing personal analysis and who was seeing me for the supervision of his work with a schizophrenic young man. After the therapy—and likewise the supervision—had been under way for several months, I noticed that two new developments had appeared at approximately the same time. Firstly, the patient began showing, in the therapeutic sessions, clear-cut evidence of hallucinatory experiences; specifically, there were strong suggestions, in the way that the patient giggled in a sexually-titillated fashion, and murmured verbal responses in the same vein, that he was experiencing some sexually-teasing hallucinatory figure in the room. Secondly, I noticed that the demeanor of the therapist himself had changed very appreciably; he had previously appeared to me to be a quite sexually-repressed person, but now was showing many nonverbal indications of seductiveness. He described, at this time, a single instance of his verbally teasing the patient; but I had the impression that the therapist was quite unaware of the probable erotic element in this teasing. My belief was, and is, that the patient was hallucinatorily responding to

not only projected desires-to-sexually-tantalize, but also to similar desires in the therapist, which latter desires were being brought toward the surface, but not yet into conscious awareness, by, I thought most likely, his own personal analysis. Again, I realize that these data fall far short of constituting solid proof for such an hypothesis. But it is my distinct impression that such was the case; for, in summary, I found the therapist to be evidencing a newly-revealed sexually teasing quality toward me, and there were hints that he was evidencing—unwittingly, as seemed to be the case in his relationship with me—a similar quality toward the newly-hallucinating patient.

It is valid, I think, to consider any hallucination as a manifestation of some affect, or combination of affects, which is being warded off from acceptance into the individual's conscious ego. Hence it is indeed correct—no matter how curious it may sound—to look upon the above patients' hallucinations, resultant from both their own and their therapists' dissociated feelings, as representing not only a *projection* of certain feelings of the patient's own, but also a struggle against the *introjection* of the therapist's dissociated feelings of this same variety. A paper by Greenson (9) in 1954, entitled "The Struggle Against Identification", provides clinical data which form an interesting comparison with the data which I have just been presenting. Greenson's data were derived from neurotic, rather than psychotic, patients and reveal these persons' struggle against identifications with *parents* from the *past*, whereas my material shows the patient's struggle against identifying with—introjecting—the *therapist*, or more specifically certain unconscious elements in the therapist, in the *present*. A sufficiently searching investigation of the transference-connections between the present and past in the experience of the patient would, I feel sure, show how integrally related are Greenson's material and my own; but such an inquiry is beyond the scope of this paper.

One last theoretical point should be made before going on to the third and final, clinical category; this is a point which pertains to each of these three categories of clinical phenomena, but it can be seen most clearly, perhaps, in connection with such hallucinatory phenomena as have been described. That is, one may say, in general, I think, that an individual must have a relatively healthy ego in order to remain convinced of the reliability of his perceptions of the other person, in the absence of any *consensual validation* from the latter, validation which, if forthcoming, would reassure him that he is indeed perceiving realistically. A therapist, for instance, must possess a relatively healthy ego to be able to carry on his daily work, relying heavily upon his own perceptions of patients in the usually-obtaining absence of much corroboration from the patients, corroboration of, for instance, the therapist's perception of preconscious or unconscious hostility, or guilt, or friendliness, or what-not, in the patient. Therapists can, and much of the time in their daily work do, successfully meet this ego-challenging experience. But the psychotic patient's ego is too weak to meet a similar challenge without his suffering a temporarily increased ego-fragmentation: if he senses that his therapist is murderously inclined, for example, toward him, but if he gets no conscious validation from the therapist that this perception is a correct one, the patient is then likely to experience an hallucination of a murderously-inclined figure; since, one might phrase it, the therapist has refused to accept the perception as being truly applicable to himself, as "belonging here upon me."

ACTING OUT AS A RESPONSE TO, OR VICARIOUS EXPRESSION OF, THE THERAPIST'S UNCONSCIOUS PROCESSES

For several years I have had the impression that some instances of a patient's

acting out may be due partially to the therapist's own unconscious strivings in this same direction; may represent, that is, a vicarious, compulsive expression of, or a response to, the therapist's unconscious desires. Since this general concept has already been described by Schroff (16) and Barchilon (3), and the identical mechanism as taking place in the patient's intrafamilial relationships has been described by Johnson and Szurek (12), Hill (10), Limentani (13), and Bowen (4), I shall give only brief examples of this general mechanism before turning to a more specific type of manifestation of it which, so far as I know, has not been mentioned in the literature.

It was about eight years ago that I discovered evidence, in work with a hebephrenic woman, that the acting out in which one's patient is involved may consist partially in a response to one's own unconscious desires. Relatively early in my work with this woman, she began to evidence, both during her therapeutic sessions and in her daily life on the ward, an intense fear lest she be raped. In the words of her administrative psychiatrist, she was "crawling with terror" in this regard; her life on the ward was largely taken up with her insistently demanding reassurance against this from one and all about her. It was only after several months of this that I became aware, I think very belatedly, of powerful urges to rape her. These urges I found so frighteningly powerful, in fact, that I confided to the Director of Psychotherapy my concern lest I be unable to control them. I might add that he only laughed in mild amusement, a response which I found vaguely belittling; but the life of a director of psychotherapy is doubtless a difficult one. I realized, thus in retrospect, that the patient's anxiety lest she be raped was probably, at least in part, a response to these powerful, and at that time dissociated, desires in me. There was much data at hand to suggest that her transference to me was predominantly colored by her earlier relationship with her father who, her history strongly indicated, had long struggled against just such unconscious desires toward her.

In later months of my work with her she began evidencing a sexually provocative behavior toward various of the male personnel-members, and after this had gone on for many weeks, I gained from my personal analysis the realization that erstwhile-unconscious homosexual desires in myself had been quite possibly a factor in this particular acting out; the realization, that is, that she had been vicariously expressing, in her behavior, my unconscious desires to make sexual overtures to these men. And still later on in her therapy I found various clues pointing toward a connection between, on the one hand, her beginning now to set fires on the ward and, on the other hand, largely-dissociated urges of a similar kind on my own part. The group of nurses on her ward at this time reacted to me as being quite directly responsible for the patient's fire-setting; on one occasion, for example, when I went up to her ward for the therapeutic session, the charge nurse bluntly let me know this. She met me with an accusing, "Edith just set a fire in one of the wastebaskets," and when I protested, "The way you nurses react to me about this sort of thing, anybody would think *I* had set the fire in the wastebasket!", she retorted, "*Well*—?" Later on, as I became more fully conscious of my own similar desires, and of the very probable influence these desires had had upon this phase of the patient's illness, I realized that the nurses' accusations had not been totally unfounded and unfair.

Now I wish to describe, in greater detail, a specific kind of phenomenon of this same general third sort—a specific kind which, as I mentioned, I have not seen described in the literature, and which has come to my attention within the past three years. This phenomenon consists in the (schizophrenic) patient's evidencing, in the therapeutic session itself, pathological and often puzzlingly

grotesque behavior which arises partially from this same source; an acted-out behavioral response to, or expression of, unconscious elements in the therapist.

I first became aware of this "introjective acting out" psychodynamic basis of such grotesque behavior in the course of my work with a deeply ego-fragmented schizophrenic woman, 28 years of age at the time when I became her therapist. During the first two years of our work together, she incessantly manifested a striking variety of bizarre, changing physical postures; looking thoroughly bewildered and acting as though the sudden and discoordinate movements of her limbs, head, and torso were taking place *via* a puppeteer's strings quite outside her control. And such verbalizations as she uttered were, for the most part, similarly discoordinate and confusing to, it appeared, herself as well as to the therapist.

Then, over a subsequent period of approximately six months, a series of incidents suggested to me that a considerable portion, at least, of her strange behavior (as strange in her daily ward-life as in her sessions with me) rested partially upon the psychodynamics—the combination of introjection and acting out—which I have described.

One of these incidents occurred during a session in which I was sitting, as I often did, slumped far down in a chair and with my knees crossed in a way which, I realized in retrospect, may well have looked grotesque to an observer. But all I was aware of at the time was that I was feeling comfortably seated and that she, in a nearby chair, began muttering something to the effect that "He comes in here and tears off my arms and legs." She then asked me, twice, to put my leg down, which I declined to do. Then, after a considerable interval, she half arose and stood with a leg extended before her, awkwardly crooked and unsupported in the air; the leg gave a peculiar impression of dismemberment from the rest of her body. I asked, astounded at this thought, "Is that the way my leg looks to you?" She agreed, convincingly. I think it valid, too, to look upon such an incident in the following terms: she reacted to my assuming a dismembered-looking posture (a posture which I had experienced simply as being a comfortable one) as being my way of serving notice upon her that I intended to dismember her. But I am quite ready to believe, in terms of my long experience with this unusually deeply ill woman, that she may indeed have felt dismembered on the basis of an introjective reaction to my grotesque posture.

My better judgment tells me that, as regards the communicational facet of this incident, what she was responding to, in me, were unconscious desires to dismember her, desires which my posture betrayed; but this I can only conjecture, for I have not recognized such desires toward her in our still-continuing work. I have clearly discerned such desires on her part, and have no doubt that *projection*, as well as introjection, was playing a part in this incident as in all these other incidents which I have been describing.

By the time this phase in our work had been reached, the patient was now able, as the above material shows, to *consciously let me know* that her bizarre posture was a response to her perception of my own posture. But by now her air of bewilderment had greatly diminished, as had her grotesque and dissociated-looking physical movements. My belief is that in this earlier, two-year phase, when her ego-functioning had been clearly more profoundly impaired, she herself had been quite unable to realize that the puzzling movements of her body had any connection with her perceptions of my own movements.

On subsequent occasions she was able to let me know, similarly, that her assuming the posture of a model on a surfboard was her way of showing me how I, draped narcissistically, I now realized, in my chair, appeared to her; and that her (now only occasional) use of verbal gibberish was a

representation of the way my own speech often sounded to her. For years she had plucked hair from her scalp and had picked her clothing to pieces, and now, in one of the sessions, as she went through the gestures of pulling the flesh of her hands to pieces, she communicated to me the point that she experienced me as picking and pulling her, with horrifying cruelty, into pieces. In each of these instances, I was able, with deep dismay at times, to find a kernel of reality in her perceiving me thus. And when late in one of our sessions I saw a horrid grimace, a grotesquely taut kind of diabolical smile, slowly come over her face as if of its own accord, I was at first baffled, and then reached the jolting realization that this "smile" was a representation of the way in which an hypocritical, forced, and undoubtedly rather cruel, smile which I had turned on, early in this session, had appeared to her.

In most such instances—and I have found many like examples in my own work with other patients, and in my supervision of other therapists' work with their schizophrenic patients—the patient's response is such a grossly exaggerated caricature of the therapist's actual behavior as to add to the therapist's unreadiness to recognize this connection. That is, the therapist is hampered not only by the fact that he has been manifesting something which he would prefer not to find in himself, but also by the fact of the patient's portraying this in so extremely exaggerated a form. Here it must be remembered that the patient's perception is grossly warped by the factors of both projection and transference. But it is very important for the therapist to be able to recognize the nucleus of *reality*-perception which lies in the patient's response, for it is by encouraging the growth of such fragments of reality-relatedness that he can be of greatest value to these deeply ill patients.

I shall mention only a second and brief example of this same phenomenon before proceeding to discussion. This example is from my work with the 32 year old schizophrenic man whose hallucinatory phenomena were described at length in the preceding clinical material. This incident occurred during that phase of our work in which intense rage and contempt toward him had developed within me, but had not yet come fully into my awareness. At the end of one of the very many sessions throughout which he had remained mute save for belching and the passage of flatus, I said, with forced "friendliness" and "politeness", "Well, the time's up for today." To this he responded with a growlingly hostile, dissociated-sounding, "Go to hell, you son of a bitch!" I recognized this, later on, as constituting not only a presumable expression of the way he felt toward me, but also a quite accurate expression of my own genuine, but repressed or at least heavily suppressed, feeling of rejectingness toward him at this moment.

Eissler (6), in a paper in 1943, made a comment which is relevant to this last-mentioned clinical incident: "... The ... [therapist's] communication, so far as it is verbal, will frequently contain more aggression than the schizophrenic's sensitivity can stand. Actually language contains innumerable terms which have changed their original meaning, so far as they have lost their primary connotations of local or physical reference in favor of a more spiritual meaning. The background of the schizophrenic's language regresses to those original meanings of a cruder, even brutal coloring. Hence, ordinary language tends to hurt the schizophrenic."

But, evidently unlike Eissler, I do not believe that it is simply that the schizophrenic *reads into* the content of the therapist's words an archaic meaning, a brutal meaning, which is not at all resident there in actuality. I believe, rather, that here again there is a kernel of reality in the schizophrenic's response; there is genuinely conveyed by the words, in such instances, brutality which is present in the therapist's

unconscious, no matter how greatly the patient's response is exaggerated through such mechanisms as projection and transference.

DISCUSSION

This paper does not represent an effort to describe all possible types of introjective manifestations which schizophrenic patients exhibit, but rather to describe only those having to do with *unconscious* processes in the *therapist*. One sometimes finds, for example, a patient expressing the conviction that persons whom he knows or has known in the past, are literally inside him now—in his stomach or in his leg or his foot, or what-not; or he may be convinced that his bodily parts are those of some other individual.[9] But such material is outside the scope of this particular study.

And I do not mean to imply that the patient introjects only those processes in the therapist which are *unconscious,* or preconscious, in the latter. I surmise that it is indeed such processes in the therapist, or some other person, that the schizophrenic patient is more prone to introjecting, than is the case with the other person's *conscious* affects and ideation—for the reason, having to do with the absence or presence of consensual validation, mentioned earlier. But I consider this particular facet of the matter to be, likewise, beyond the focus of my effort here.

A third point is already implied in this paper, and needs to be made explicit only briefly: the *therapist* not uncommonly has introjective experiences vis-a-vis the *patient*. In my own sessions with schizophrenic patients, I have had, not infrequently, feelings and fantasies which seemed distinctly alien to my usual experience, which I experienced as foreign bodies in my consciousness, and which I regard as instances of introjection on the part of the therapist. And I have heard, many times, fellow therapists describe similar experiences.

This, in turn, brings up the therapeutically *constructive* side of this whole matter. The therapeutic usefulness of these last-mentioned experiences, experiences of introjection by the therapist, is, I believe, very great; they seem to me to constitute the essence of the therapist's empathic sensing of what is transpiring in the patient. And, as I indicated in a paper in 1955, this same process, carried one interpersonal link further, helps the supervisor to sense what is occurring at a deep level in the therapeutic relationship which is being described to him by the therapist in the supervisory session (19).

And, as regards the therapeutic relationship itself, although I have utilized here the frame of reference of the patient's *vulnerability* to the therapist's unconscious processes and, in keeping with this emphasis, have presented examples of disturbances in patients' behavior in this connection, one can see on the other side of the coin an invaluable communicational aspect to this. It is as if the patient were trying to tell the therapist, in all three of the varieties of introjective manifestations which I have described, "See, this is the way you look to me," or, "See, this is what is going on between us, below the surface."

I believe that the constructive aspect of these introjective processes in the therapeutic relationship resides not only in this furtherance of *communication*, but resides also in—to present a formulation, now, at which informal discussions with John L. Cameron, a colleague on the Chestnut Lodge

[9] A few days ago, for instance, I read the following item in the daily nurses' report concerning one of my female schizophrenic patients. This item was written by a middle-aged female attendant who has an excellent relationship with the patient: "...Called me to rub her back. Says she has my knees. 'Why, Ruth?' 'Because my knees hurt.' 'How did you know my knees hurt, Ruth?' 'Last week you walked funny and this week you don't.' I told her that was because I was wearing my arch supports. 'I'm glad for you; but every time you get a new body they give me your old one, and you change bodies so often.' I told her it was the same old body but just bulged more in some places. She had a good laugh over that one and laid her head over against my arm. Says there are people in her legs and their heads are the hips."

staff, have helped me to arrive—a process which is even more directly therapeutic. I refer here to the seeming circumstance that the therapist, at the deepest levels of the therapeutic interaction, temporarily introjects the patient's pathogenic conflicts and deals with them at an intrapsychic, unconscious as well as conscious, level, bringing to bear upon them the capacities of his own relatively strong ego, and then, similarly by introjection, the patient benefits from this intrapsychic therapeutic work which has been accomplished in the therapist. Incidentally, I believe that the patient, on not infrequent occasions, gives the therapist the same kind of therapeutic help with the latter's intrapsychic conflicts. Concerning the benefits which the patient obtains by introjection from the therapist, the following comments by Hill (10) are of interest: "... schizophrenic patients ... differ conspicuously from hysterical patients in their lack of immoderate admiration, affection, love, and so on, for their physician. ...

"That the patient does not mention those qualities of his physician which he admires does not mean that he fails to note them. What he does with them is characteristically schizophrenic. *He takes them in as if they were mother's milk, thereby incorporating some of the goodness which comes to be his own and upon which his ego feeds and grows* (italics mine) ... He is good, and the badness is left with the doctor. ..."[10]

Wexler (21) and Hoedemaker (11) also have published valuable clinical examples of, and theoretical observations about, schizophrenic patients' recoveries as being facilitated by introjective responses to the therapist. Both these writers have overlooked, however, the *mutual,* two-directional, nature of this process, and have taken little note of the fact—in my experience—of the therapist's participation here upon unconscious, as well as conscious, levels.

[10] Reference No. 10, pp. 205–206.

My final observation is directed toward those therapists who do not yet have relatively thoroughgoing personal analysis, and lengthy clinical experience, behind them; to others, this comment will be superfluous. I would regard this paper as having been harmful, rather than helpful, if it accentuated a therapist's irrational feeling of responsibility for what transpires in the therapeutic session, and in the overall course of the patient's illness. The therapist has a responsibility, to be sure, and it is a large one; but it is shared with many other persons, including the patient himself, and it does not extend to the irrational extent of requiring that one be free from the influence of one's own unconscious. I have long ago become convinced that, quite on the contrary, psychotherapy with schizophrenic patients requires that the therapist become able to rely, more and more readily, upon his unconscious as being in the nature of a friend, a friend indispensable both to himself and to his patients. Among such clinical incidents which I have described from my own experience, even those which at the moment caused me the greatest dismay proved subsequently to be of inestimable value in illuminating the nature of the transference as well as the countertransference.

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HUMAN VALUES IN MEDICAL EDUCATION[1]

JOHN R. REID, PH.D.[2]

From time to time it would seem wise to use the pages of a scientific journal to communicate to its readers the thoughtful reflections of experienced observers in its fields of specialization. Because of their freedom from the restrictions of the usual scientific communication, such essays can allow great latitude for the expression of considered opinion and unproven hypothesis. One would hope that such presentations would serve to stimulate investigation as well as to clarify problems that constantly arise in handling clinical material. Such is the intent of Dr. Reid's comments on human values in medical education.

The Editors

The doctor's job, I am inclined to feel, is the most important in human life, for it deals with the essential conditions of life itself. A doctor is usually present, even if he is only letting nature take its course, when we come into this world and also when we leave it, as well as at many times in between—times of trial and crisis. No job could, in the literal sense, be more vital, or more important.

All of us, therefore, have a vital interest in doctors—in what kind of people they are and in how they have been educated. If the engine of our car knocks, we are satisfied if we can find, in the nearest garage, a competent mechanic who can fix it. But if our heart pounds so hard, whenever we get up to make a speech, that we cannot hear ourselves think, let alone utter an intelligent sound, then we want more than a good technician—say an expert in electrocardiography. We want a good human being, who is warm and sympathetic, who will help us to understand our problems about insecurity and our need always to be succesful, who will—if you prefer the more technical jargon—help us, through self-insights gained in a therapeutic setting with proper transference, to overcome our excessive narcissism and to satisfy in some more adult fashion our residual "oral" needs. To be sure, the layman, as does the doctor when he is ill, wants relief from pain, some anodyne to deaden suffering. And if the pain is acute or the suffering unbearable, he will—if he has to make a choice—doubtless prefer, and wisely so, a physician who is at home in the pages of the pharmacopeia to one who is at home in the pages of Plato. But if Plato cannot teach the physician the proper dosage of morphine or what are the indications for an immediate appendectomy, he may on less urgent occasions throw some light on the role of pain in education or on the moral question—itself to be sure quite "urgent"—of whether, as in the case of Socrates condemned to die by the Athenian judges, death will not under some circumstances be preferred, by a good man, to life.

All of us, then, are quite naturally interested in having good doctors, which means, by logical extension, that we ought also to be interested in their education. For if good doctors are born, so also unfortunately are bad ones, and some of the latter kind—if endowed with a sufficiently thick skin, strong drive, and retentive memory—may even manage, by hook and crook, to get through an A-grade medical school. While native ability, suitable temperament, and previous scientific training are undoubtedly

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of tremendous importance, sometimes I wonder if the deans of our medical schools, as well as other members of our faculties who are deeply concerned with the problem, have not spent comparatively too much time on selecting "the best material" for entrance and too little time and thought on the problem of what happens to these high I.Q. boys, with their A's in physics and chemistry and biology, after they have jumped over innumerable hurdles and finally enter, not infrequently a little dazed and exhausted, their chosen medical school.

What in fact does happen to them? As you all know, if it is sometimes an exciting and usually a rewarding, it is also for many students an upsetting and occasionally a depressing experience. In an atmosphere reeking of phenol and formaldehyde, the medical student is introduced, not to a live human being who is sick and in trouble, but to an ex-human being that is quite dead—the emotional implications of this fact hardly being neutralized by the use of the word "cadaver." With eyes smarting and not infrequently with stomach turning, the medical student is suddenly, with little or no emotional preparation, faced with the fact of death and perhaps the more terrifying fact of life in medical school, with its cut-throat competition with the other Phi Betes and (as he self-punitively imagines) "indefatigable grinds." The body before him is grey, slippery and confusing and the heavy textbook, which is supposed to describe and explain it, he finds dull, largely unintelligible and completely overwhelming. Is it any wonder that many a student, after a few days of this ordeal, becomes weary and sick at heart, and asks himself if, after all, he really wants to be a doctor?

This is gross anatomy, or rather one emotional aspect of it. What about histology? Well, it as least smells better here and the work is cleaner, but this esthetic gain is at the expense of a loss in tangibility and a kind of vital connection with our bodies and their motions as these are known to us by direct experience. In most schools, the emphasis here too is on memorizing what the book says and on the capacity to identify slides. As for the examinations, if I may generalize from my own experiences and observations in medical school, they often reduce the student to the level of the quaking, and needless to say non-thinking, jelly-fish. Well do I remember, more like a nightmare than a useful learning experience, those "histy" practicals, with our instructor (a fear-inspiring stickler for details) standing up against the wall, with a stop-watch in his hand, and uttering at fixed intervals in a tight, cold, staccato voice, "You have thirty seconds," while the students, their hands trembling with nervous haste, tried to adjust their microscopes and to identify the strange-looking slices of tissue dyed with unfamiliar stains selected on purpose (I used to imagine) to produce the maximal likelihood of confusion and error. That only two members of our class of sixty students ended up during the first year as patients in mental hospitals, speaks cogently for their toughness and adaptability in the face of what I still consider to have been unreasonable demands, with far too much emphasis placed on minute structural details, having no functional significance, and even on memorizing long lists of synonyms for terms never operationally defined. Is anything more deadening to the spirit than nonsense fortified by technicality?

Only one story about biochemistry. In my naiveté, I thought empty verbalism was to be found chiefly in metaphysics. So it came as something of a shock when a friend of mine in the class, glibly repeating what the professor had said, proudly announced to me that, "The NPN is high in eclampsia." When I asked what eclampsia was, he first looked blank and then laughed. "Gosh," he said, "I haven't the slightest idea!" With a little formal logic, he might at least have inferred that it is a condition in which the NPN in high!

These comments refer of course to only

one side of a many-sided problem, and frankly are intended to be provocative. But it is certainly no part of my intention to imply that anatomists and biochemists are not as warmly human and morally sensitive as are teachers in other preclinical and clinical departments in our medical schools. Such an invidious comparison would, if generalized, be as odious as it would be unwarranted.

However, before we try to explore more objectively and adequately the human values at stake in medical education, it will be necessary, if we are to know with sufficient precision what we are talking about, to ask ourselves how we are using the word "value." Logically, this problem of definition comes first in any value analysis or appraisal, for unless the reference of the term "value" is clearly and unambiguously specified, no entity, process, or relation, which is found in direct experience, can be significantly or correctly identified as a value. On the other hand, once some definitional rule, governing the application of the term, is set up or agreed to, then it follows that anything found in experience, which conforms to the logical conditions of class inclusion-exclusion stipulated by our definitional rule, is—or is not—a value. This latter consequence, being tautological, is beyond question, for the same kind of reason, ultimately, that the truth of the proposition, "two plus two equals four," is beyond question, *i.e.*, is a so-called necessary truth, even though two quarts of water and two quarts of alcohol when added together do not equal four quarts of liquid.

What then do we mean by "value?" Plainly enough, if we abstract from life in the concrete and the needs and preferences it generates, there would be left, as an objective residuum, no values but only neutral entities, no parts of which and no relations between which are values. What such a statement really means is that, if we adopt the standpoint of customary usage, we can find no referent for our value terms among or internal to non-living systems of events. Since our time is limited and this paper is restricted to human values, we shall omit discussion of a number of controversial borderline cases between the living and the non-living. Hence, we shall not debate such questions as whether enzymes "love" their co-enzymes or some viruses "hate" aureomycin. If any metaphysically inclined biologist present wants to postulate a continuum of values, ranging from large protein molecules below to (say) an Absolute Spirit above, I shall not quarrel with him, but only ask him to define his terms so that they will not be empty of empirical meaning. This is not, I think, an unreasonable demand, seeing that it is logically a necessary condition of the statements he asserts being either true or false, *i.e.*, strictly speaking, "statements" at all. Similarly, if our gardener speaks of such-and-such a plant "wanting" shade, I interpret his statement in basically the same way as that of a British philosopher, who taught at Stanford one summer, and used to speak of his car "wanting petrol." That is to say, I infer that the operationally significant part of the gardener's statement is that if the plant gets too much sun or not enough shade, it will fail to thrive or may, indeed, shrivel up and die; and analogously, I infer that the meaning of the philosopher's statement is that his car is nearly out of gas, which is, in the context, of practical interest because the car *cannot* run without gas, *i.e.*, gas is a necessary condition of such-and-such a sequence of desired events.

The end of this last sentence contains a clue which points the way to a solution of our definitional problem about value, *i.e.*, the phrase, "a sequence of desired events." Whenever one consequence of an action is preferred to some other, a value relation is enstated. More generally, when some content of immediate experience is liked or disliked, is found satisfactory or the opposite, that total experience contains a value, positive or negative, *i.e.*, an intrinsic value rela-

tion. This is true whether the content of experience is illusory or veridical, whether it is perceptually conditioned by the normal activity of extero-ceptors, and interpreted by a brain functioning rationally, or whether it is a phantasy begotten on sensory illusions out of the unconscious actions of repressed wishes. "Value," according to this definition, is a term which designates an intra-experiential relation between a motor-affective attitude on the one side, that of the subject, and some given content of experience, on the other side, that of the object. The word, so defined, implies that the subject must be more or less conscious and able to respond discriminatingly: for example, to taste with relish this substance and to swallow it with satisfaction and to spit out or reject with a feeling of disgust some other substance; to sniff this odor with pleasure, along with, perhaps, some warm, agreeably relaxing para-sympathetic side effects, and to make a face, to turn away from, and perhaps to feel some retching impulses growing out of reversed peristalsis when smelling some other odor; to hear some sounds and to see some sights with a sense of free spontaneous delight in the rhythmical pattern of sounds in the one case or the colored visual Gestalt in the other, or to feel that this stretch of Wagner is irritatingly pretentious or that Picasso is plainly hideous; to welcome the clear air and blue sky and warm sun and green leaves of a beautiful spring day, with its rich associations of love and of renewed fulfillment, or to sink deeper into a reactive depression when, looking out of our window on a cold, bleak, overcast day in November, we see only dirty, ugly buildings, misshapen expressions of a warped sense of esthetic values and of vulgar greed.

This list of examples could, of course, be extended, but the idea is, I think, clear enough. The idea is that value, in its ultimate and generic sense, is a relation in our experience, a relation that is instituted by our taking up some motor-affective attitude, positive or negative, toward some content of experience. This content may be simple or complex, may be projected or introjected, may be referred to the past or to the future, and may be more or less highly mediated by various kinds of cognitive activities. This value-relation is, of course, existentially conditioned by extra-organic processes, (air, water, food, and so on) and also by various intra-organic processes, ranging from the hydrogen transfers involved in energy-yielding oxidation-reduction reactions to the subtler organic harmonies and dissonances produced by the "endocrine orchestra." A great deal of medical science and practice is of course concerned with understanding and controlling these intra-organic processes, which underlie and so intimately condition and color the background of our value experiences. After all, people come to doctors, and are willing to wait often for hours even in pay clinics, because they feel ill and prefer to feel well, the *truth* of the value judgments involved being so obvious and indeed self-evident that it is usually taken for granted.

As these latter points suggest, while any actual value is a relation within experience, all sorts of things both in and outside our bodies are more or less valuable in their diverse roles as causes of, means to, or signs of, such immediately felt values. Hence, when we stop to consider the matter, it becomes obvious enough why, in our thinking about values and in our efforts to predict and control, to improve and extend, values, we spend most of our time and thought and effort trying to discover the *relations* between values and other processes, which latter do not intrinsically contain values, such things, for example, as oxygen and carbon dioxide, morphine and penicillin, a low-salt diet or a plastic nose operation, so that perhaps some modern Cyrano may win the girl of his dreams before he is too near death to do anything about it. The end here implied of staying alive or gaining relief from pain or getting over an infection or preventing

congestive heart failure or improving one's appearance and hence reducing the narcissistic injury to perhaps a hypersensitive ego, these ends, these positive values and shifts from negative values, *i.e.*, these algebraic increases in value, are taken for granted by both the doctor and the patient as "a move in the right direction." Because this assumption is shared, without any need for either arguments or implied threats by both the patient and the doctor, because they have to a variable but frequently to a considerable degree the same ends in view, the doctor-patient relation rests upon a sound basis that is vital to both and is not questioned by either.

At one point in the above analysis, I referred to the fact that values may be more or less highly mediated by cognitive activities. This statement raises a number of important questions which unfortunately are rather involved and technical and can only be dealt with on this occasion in a superficial and inadequate way. For here we face a whole set of problems about value judgments.

As we have seen, actual values are felt in direct experience. But things not experienced are said to have value or to be valuable. What this means, in terms of our value theory, is that these things are related to value experiences in certain ways. In what ways? As we suggested above, rather incidentally, these things are related to values as conditions of value, as means to value, or as signs of value. Let us examine briefly each of these relations, taking up first that which I have called "condition of" value.

As is well known, if the CO_2 content of the arterial blood falls below a certain level, the inspiratory center is inadequately stimulated and as a consequence some degree of respiratory failure will ensue. However, not only is breathing at times a sensuous pleasure, but the maintenance of the respiratory function is, of course, a necessary condition of life. Hence the CO_2 in this context has conditional value, if we agree, as sane people generally do, that life has value. In fact, even those who, indulging in a form of literary pessimism, may verbally deny this, usually behave in such a way as to belie their words, *i.e.*, they breathe air, drink water and other liquids, eat with evident relish different foods, look at and sometimes approach and at least try to "manipulate" various love-objects, and in other positive ways show that Eros has not yet been defeated in his ultimately losing fight with Thanatos. But these latter interested activities yield immediate values, and it is in relation to such pleasures and satisfactions, felt by some organism, that a value judgment, expressing the claim that CO_2 has conditional value, must ultimately be justified. Just as the proof of the pudding is in the eating, so the proof of the breathing is to some slight degree in the liking of the process but mainly in the liking of all the other objects and activities which, without the breathing and hence without the CO_2, would become impossible. Such conditional values are, therefore, in the biological sense, crucial, and our bodies, in their "wisdom," behave accordingly,—*if* still other conditions permit, since no organism is completely autonomous nor enjoys an infinite capacity for adjustment.

A word now about "signs of" value. Doctors in doing physicals and making diagnoses and treating patients are constantly interpreting what they see, hear, smell, touch, and so on, as signs of various conditions, normal and abnormal. Thus such-and-such tactual data, given on abdominal palpation, are signs (say) that the free edge of the liver extends two fingers below the costal margin; such-and-such visual data, on examining the ocular fundi, are signs of diabetes mellitus; such-and-such a tone of voice and manner of speaking, on the part of a patient, are often signs of hostility, perhaps unconscious; such-and-such gaps in the anamnestic material may be signs of repression and suggest hysteria. Some of these signs, for example the latter,

have a very low order of reliability, and unless confirmed by other signs with a satisfactory convergence of the evidence, they would not justify the inference suggested. But while the subject is an extremely important one for medical education, I am only concerned here to illustrate the general fact that such signs are not only signs of value in the sense that they give rise to and may warrant certain inferences which are valid and useful for diagnosis and treatment, but they are also signs of value in the sense that the conditions signified are either themselves actually negative values or more commonly are conditions of such negative values. Indeed, if the latter were not the case, most doctors—being interested primarily in disease and not health—would lose interest in the signs, and perhaps even cease to recognize them as such. As others have pointed out, this almost exclusively negative orientation on the part of many members of the medical profession is not, for their patients or for the public generally, an entirely unmixed blessing. There are other ways of pursuing the good besides fighting evil.

This leaves for brief discussion the relation of means to values. Such means-end relations are the very heart of medical practice. The doctor faces a clinical problem and he uses an imposing array of tools to investigate and to solve the problem: techniques of interviewing and history taking, various skills and modern instruments in gathering observational and laboratory data, logical methods (it is hoped) in analyzing and interpreting and evaluating the data and in deciding what the data indicate as to likely prognosis and as to the best method of therapy. Having decided on such-and-such a course of therapy, the doctor then looks into his therapeutic armamentarium (blessed word) and selects the most effective weapon or weapons to fight the disease—by eliminating the cause surgically or by neutralizing it chemically or by increasing the patient's resistance to it by any of a large number of methods, ranging from shots of antigen through corrective exercises to a long course of psychoanalysis. But in using these different tools or means, the doctor has the same ultimate goals or ends in view, *i.e.*, to help the patient in every way possible, to relieve his suffering and to restore him to health.

Now these means-end, cause-effect and sign-significate relations are, from the standpoint of our value-theory, all cases of *extrinsic* value-relations and the means, causes, or signs in question have, accordingly, value properties; that is to say, they have properties such that, if they occur in suitable contexts, they lead to the experience of *intrinsic* value-relations, *i.e.*, to actual felt values. The moral use of intelligence everywhere is to increase our knowledge of the causes and signs of such actual felt values, so that we may select effective means to a good life for ourselves and others—a good life which, as Bertrand Russell has said, is "inspired by love and guided by knowledge."

Our belief that one or the other of these extrinsic value-relations holds, in some given case, is commonly expressed in the form of a value judgment. Such value judgments may vary in explicitness and determinantness of reference from Osler's "Morphine is God's own medicine" to "Electroshock treatment is often effective in involutional melancholia" to "In our series of duodenal ulcer cases, we found that a subdiaphragmatic vagotomy, combined with a posterior gastroenterostomy, produced the best results."

As we saw above, doctors generally take for granted the desirability of such-and-such goals of treatment or the preferability, from the patient's point of view, of being in one total psychosomatic state as contrasted with some other. If these goals are formulated in sufficiently general terms, such as relief from pain or weakness, anxiety or depression, or positively as improved health or increased efficiency and happiness, every

patient not overwhelmed with guilt or hell-bent on self destruction will share these goals, since all of us tend to operate on the Pleasure Principle and to be hedonists in practice if not in theory. In view of this general agreement about ends, the value judgments of the doctor—this is indeed true to a large extent of all of us—are usually not explicitly about desires and preferences, pleasures and satisfactions, *i.e.*, actual values or the critical appraisal of different value alternatives in cases of possible choice, but his value judgments are about value properties, mostly those which are causal properties. Hence the judgments in question have the status of value judgments only in the sense that they are about things, procedures or states which underlie or will, if certain conditions are fulfilled, lead to directly experienced values. But for purposes of technical description and analysis or for purposes of achieving maximal exactitude in our formulations and communications, we often abstract from the human values involved and speak of the causal properties or whatever is under discussion in comparatively neutral terms. However, both types of consideration may be explicitly involved, as when we judge a treatment to be effective but unfortunately very time consuming or for most patients prohibitively expensive, or that another treatment effects a radical cure, when it works, but that the outcome, in a given case, is highly uncertain and not infrequently produces dangerous side effects. Doctors are constantly making such judgments of practice and these judgments are manifestly about values, both positive and negative, as well as about neutral facts.

Particularly in doing psychotherapy, the doctor is concerned with values and conflicts between values, since in this type of therapy, disturbances in the motor-affective life of the patient are at least the starting point of the doctor's inquiries, and to bring about certain desirable changes in the patient's motor-affective life, *i.e.*, his conflictful and irrational but still for him pivotal values, is the central goal of therapy. In this process of emotional re-education, the beliefs and ideals of the doctor cannot be, even if this were desirable, completely kept out of the picture. No matter how well analyzed he may be, these basic values will, unwittingly or intentionally, bias and color as well as help usefully to guide not only specific interpretations of the patient's material but also more generally the whole style, atmosphere and moral orientation of the treatment. This is inevitable and not undesirable if the doctor, in addition to being technically well trained, is a wise and clear-headed person, who is sensitive to and has a proper concern for the patient's own values, understanding—without undue ego repercussions in himself—that the patient's values as regards sex, money, art, religion or politics, may legitimately and even usefully differ from his own, and that his own role is not to play God, but, in some more humble fashion, to try to be of service to his patients. After all, M.D. stands for Doctor of Medicine, not Master of Divinity.

In most of our discussion so far, I have been trying to make certain points which I believe are basic to understanding human values, their biosocial origins and their status in experience. While there are hundreds of further points which are relevant and really need to be investigated, I feel that I ought now to return to some problems touched upon earlier which are more specifically connected with medical education.

Medical education, like any other kind, is a problem of means-end relations, *i.e.*, it is both a technical problem and a moral problem. Since some doctors, who rather plume themselves on being scientific and hard-boiled, seem to dislike the word "moral," let me explain that as here used it simply means having to do with values in the somewhat restricted sense of concern for making the best choice, *i.e.*, of increasing the probability that our choice will maximise the totality of positive values that it

is feasible for us to produce under the circumstances. This is, whatever we call it, a matter of the very last importance for all education and for human life generally. Logically, the moral aspect of this problem of medical education should be considered first, lest as educators we lay ourselves open to the sort of charge Santayana directed against American businessmen, *i.e.*, that having "lost sight of their aims, they redoubled their efforts."

First then, what sort of doctors do we want or need? Doctors are, of course, needed for many different kinds of jobs, all of them important and each to some degree requiring different sorts of knowledge, skills, and possibly value attitudes. We expect, and we usually find, the personality and the orientation of the surgeon, the internist, the psychiatrist, or the public health man, to be rather different, and a good many of the jokes and a good deal of the hackneyed verbal by-play between these different specialists, as they meet each other in the corridors of the hospital or at the luncheon table, reflect these stereotypes. But are there not some generic traits of character and of knowledge that all doctors should possess in common? I think each of us would be inclined to say "Yes" to this question, even if we cannot adequately specify these generic traits. The following suggestions are not offered as final answers to this difficult question, but are made in the hope that they will stimulate discussion.

What then is our picture of the good doctor? Needless to say, he is a person who is natively intelligent and who possesses some minimum of technical information—though other things being equal, which they rarely are, the more of this the better. He must first of all, then, know his stuff and be able day in and day out, and perhaps occasionally for several nights running, to perform competently—even, or perhaps especially, under stress-inducing conditions. Even though he is a surgeon, who does his most important work for patients while they are asleep, it is highly desirable for the doctor genuinely to like people. He should be easy to interest and hard to bore, and helping people should be spiritually, as well as materially, his meat and drink. No matter how sharp his wits nor how extensive his knowledge, if he is a narcissistic character, always up stage and playing the star role, and forgetting about the needs and rights of the supporting cast, his patients will forsake him and his students, if unwisely he is permitted to have any, will—to say the least—never feel for him that mixture of love, respect and devotion which is the chief reward of the great teacher who selflessly gives of himself to help his students to grow in knowledge, insight and skill, even if their native gifts and perhaps better opportunities make it obvious that they will, in turn, be able easily to surpass his own attainments. The good doctor, then, will be warm, kind, and sympathetic, with that sort of compassion for the suffering of others which all of us need, particularly when we are ill and are hypersensitive to every stimulus, when we have regressed, at least for the time being, to a more or less infantile stage of emotional dependence.

In addition to having such moral qualities, should not the good doctor be also a man of culture? This is a vague phrase, I know, and what is perhaps worse, in using it one runs the risk of sounding rather snobbish, in the sort of holier-than-thou style of the humanist who is steeped "in the best that has been thought and said," the sort of scholar "to whom nothing human is alien"—except other people. But still, as I occasionally remark to students in psychiatry, who have, it sometimes appears, only recently heard about the Oedipus complex, they might profitably re-read "Oedipus the King" or "Hamlet" or—to take a more modern instance—"Mourning Becomes Electra." Or, if they are trying to understand the need for punishment in some guilt-ridden patient, that they will surely understand better what is going on, which

often appears to them very paradoxical, if they have not too far in the back of their minds Dostoyevsky's great novel, "Crime and Punishment"—though, of course, all his works are inexhaustible mines of psychological insight. Or if a young doctor, trying to get started in practice and struggling to make ends meet while his wife struggles even harder to get ahead of the Jonses, if this poor devil, caught in a hundred social dilemmas and professional conflicts, turns to George Eliot's "Middlemarch," he may find his problems clarified and his burdens lightened by intimate contact with that singularly astute and penetrating mind.

But these examples, while not exactly chosen at random, are only a few from a multitude of literary classics or near classics which, since patients are human beings, throw light—quite as important as some of that shed by (say) Gray's "Anatomy" or Harrow's "Biochemistry" or Boyd's "Pathology"—on the problems upsetting and the disorders affecting what Spinoza called the mind-body mode. As we have been told on high authority, as a man thinketh in his heart, so is he, and what he thinks and feels and hopes for and strives for is at least partly determined by what he has read, pondered and finally assimilated, until it has become a part of his working habits and guiding ideals.

Doctor Krantz, in a brilliant and original paper which he read last year before Alpha Omega Alpha fraternity, described the modern doctor as enjoying a position of "sociological dominance." If the doctor is to enjoy the privileges of this position much longer and if he is to discharge in a socially useful way the responsibilities that go with it, then I suggest that in addition to looking into and doing something about the problems created by man's uncontrolled fertility in conjunction with the limited quantity of arable land, he also needs to study and to reflect upon a whole range of problems—economic, political and moral—which not only affect how long we may live and how many of us live, but what is perhaps more important, how many of us have access to those kinds of educational and cultural opportunities which alone make it possible for us to live a full and well-rounded life that is distinctively human in its values and its achievements. This, I take it, was the moral of Dr. Krantz's paper, that not more life but the good life should be fostered by our medical education and social practices in the larger community.

In this picture, perhaps not entirely drawn from life, of the good doctor, we have not, I think, said enough about the intellectual side of his mind. Since the doctor spends much of his time, though (many critics feel) not as much as he should, listening to the talk of patients, it behooves him to study and to think about the problem of communication—a subject rightly stressed, I feel, in our Department of Psychiatry but one almost equally important in every branch of medicine. Not only for getting a history, but for the more important purpose of getting really to understand the patient, his problems and conflicts, his angers and fears, as well as the manifold ways in which such emotional factors affect, being indeed processes of and within, his body, for all these reasons it is essential that the doctor become something of an expert in the art—or science, if you prefer—of interpretation and communication.

After all, our minds are highly complex organic functions that are largely developed and stimulated and maintained through interpersonal transactions in which language plays a crucial role. In recent years the great importance of this subject has been widely recognized and we now hear much talk (only part of which is intelligible) about general semantics and cybernetics. Nevertheless, the serious study of processes of sign-functioning and the consequent awareness of the immense importance of this study for all of our investigations of and dealings with our patients (not to mention our colleagues) is something hardly

thought of in setting up curricula in our medical schools. But in my judgment, such a study, perhaps best called simply medical logic, ought to be an integral and functioning part of medical education—not just philosophical trimmings added as a kind of incidental afterthought, to be lopped off by the dean at the first twinges of a contracting budget and to be ignored by the students with no peril (as they infer from most of their teachers' attitudes) to their medical salvation and later earning power.

While relevant throughout medical studies, such critical training in the analysis and clarification of thought-processes, in the testing of hypotheses and in the appraising of evidence, as well as in dealing with a long list of related questions concerning nosology and etiology and therapy, such critical training is obviously essential if many of the students in our courses on physical diagnosis and introductory medicine and perhaps above all in psychiatry are not to remain unnecessarily muddled over the basic concepts and principles and techniques of these subjects and disciplines. Technical facts which are not understood do not even constitute information, let alone usable knowledge or clinical wisdom. And few studies, I submit, contribute more profoundly and lastingly to the development of critical understanding than do studies in logic and semantics, if these are pursued, not in remote halls of learning, which are better insulated against enlightening and sobering contacts with reality than against heat and cold, but in the atmosphere (say) of the court or the clinic, in daily contact with the situations that give rise to the vital problems whose solution is, after all, largely the justification of the logic as of other intellectual and scientific techniques. Whatever we may feel about art or beauty for its own sake, concern with validity for its own sake—except, of course, to the extent required to understand it—is symptomatic of an obsessional neurosis, with the echolalic refrain, "A is A, come what may."

Dr. Dana W. Atchley, whose ideas on medical education seem to me both timely and wise, wrote a few years ago that "The greatest need of the student of medicine is the capacity to analyze the material which modern scientific methods so richly place at his disposal. The student often shows little sense of relative values and poor appreciation of the admissibility of a fact as evidence; for example, a finding equally compatible with a dozen diagnoses is adduced as specific evidence for one. Complicated statistical studies are not being recommended at the moment; this plea is merely for simple logic, for an orderly intellectual approach. The student must learn how to select his facts properly and from them to build up a tenable hypothesis or else to recognize that the data are insufficient for such a step. He must assess the various components and integrate them into a mechanism that is rarely static. He must seek to determine direction and velocity whenever it is possible. Every phenomenon that he observes should leave him unsatisfied until he has learned its meaning."[3]

In a private communication, Dr. Atchley added the following, which is so pertinent to the topic under discussion that, in spite of its personal references, I cannot forbear to quote it. "I have read your plan for a course in medical logic and am in hearty agreement with it. I may say that I spend as much, if not more, time on my teaching rounds with the clinical clerks, on the principles of logic as I do outlining the patterns of disease, which they can read in any textbook. The critique of scientific thinking is sadly lacking in most students and medicine has been taught so much as an art that the introduction of scientific standards is still an amazingly novel approach. A course such as you suggest would be valuable, but even more so would be the point of view that you propound as part of the orientation of

[3] ATCHLEY, D. W. Orientation of undergraduate medical curriculum. Science, **104:** 67–70, 1946.

all of our teachers, particularly in the clinical branches."

It might be interesting to note also the views on certain related topics of a leader in British medicine, Dr. A. E. Clark-Kennedy, Physician to the London Hospital and Dean of the Medical School. In his splendid essay on "The Art of Medicine in Relation to the Progress of Thought," he wrote in 1945, "The practice of medicine touches philosophy at many points.... A purely scientific education is inadequate for a profession which deals with so close a relationship between mind and matter, and an education in the arts alone is insufficient for minds compelled to live in a material world. Yet philosophy has dropped out of medical education, and the tragedy is that medical education seems to trail along after a 'half-baked' materialism, already out of date, in an age when medicine could, and medicine must, help to integrate the arts and sciences in University education, if our sense of proportion is to be once more restored. Unless this can be done, we run the risk of losing our intellectual balance, and sinking in the sea of our own widening knowledge."[4]

Sometime back I started out to delineate, in broad strokes, my conception of the good doctor. It seems that, by a natural process, I have gradually slid over into the question of what educational means are likely to produce such a doctor. Thus we see how our ends-in-view inevitably affect and guide our choice of means, though we should not forget the other side of the matter, emphasized untiringly by John Dewey, that means also and often quite insidiously determine our ends—sometimes all too literally, as recently seeing "Darkness at Noon" reminded me. We cannot motivate medical students by fear or treat them like robots with "miraculous memories" even with no minds and then rationally expect them to become, in dealing with their patients, friendly, sympathetic listeners (who ever listened to *them*?), or to become alert, critical, imaginative investigators, or to become, in general, well-rounded doctors with clear heads and warm hearts, who know what they are doing and who want to do it as well as is humanly possible.

But if medical students are treated like adults instead of like recalcitrant and rather stupid children who must, for their own good, be spoon fed with castor oil; if it is recognized in practice that students have important differences between them as to strength of drive, stability of moods, capacity to recall, ability to think, need for privacy, optimal pace for work, sensitivity to threats, and a hundred other important factors bearing upon the learning process; and if it is further realized by their instructors and understood by the students themselves that these differences do not place them in a rigid hierarchy of superiors and inferiors, as the grading system tends inevitably to imply, with its consequent engendering of frightening and embittering competition and hostility; if a little psychiatric enlightenment along with a good deal of friendly common sense is used in helping students to plan their work and to get over rough spots on the road to knowledge and self-understanding; if, finally, the whole teaching program has a minimum of "the system and law that kills" and a maximum of "the spirit that gives life": *if* these things are done and they can be done if the administrators and teachers in our medical schools really want to do them, then I firmly believe that not only would medical students down to the last man or woman be happier, but that they would learn more, remember the important and usable parts of it longer, apply their knowledge with more insight into its meaning and better judgment as regards its limitations in practice, and would in general be better doctors, more sensitive to the human needs of their

[4] CLARK-KENNEDY, A. E. *The Art of Medicine in Relation to the Progress of Thought*, pp. 43–46. The University Press, Cambridge, Eng., 1945.

patients and more eager to do everything in their power to satisfy these needs. When we, their teachers, respect the human values, all similar and yet all different, in the lives and work of our students, we thereby do most to contribute to their medical education, both intellectual and moral, and to help each of them to grow into the kind of doctor who will know and practice what Francis Peabody had in mind when he wrote that, "the secret of the care of the patient is in caring for the patient."

A NOTE ON FIRST ADMISSIONS OF THE AGED TO MENTAL INSTITUTIONS

SEYMOUR PARKER, PH.D.[1]

Many studies concerning the epidemiological aspects of mental disorder have pointed to the problems associated with the use of the statistics on first admissions to mental hospitals as a means of gauging the true incidence of pathology in the population (8). It is well known that differences in first admission statistics may reflect differential use of the mental hospital, as well as providing information about the distribution of psychic instability or social disorganization in a given population. This problem becomes particularly pertinent in the analysis of first admission rates of the aged, where so many social factors (*i.e.*, family structure, employment patterns) may vitally influence the data (1). This paper will attempt to evaluate the relative influence of three factors on statistics regarding first admissions of the aged to metal hospitals—age composition of the population, occupational structure, and the rural-urban residence pattern. By using the same population base, we will attempt to determine which of these factors can best explain variations in first admission statistics.

In order to minimize the error involved in different reporting standards and procedures, first admission statistics from fourteen states designated by the National Institute of Mental Health as "the model reporting area" (7) were used. As a further means of rendering the statistics more comparable, we compared the states by computing the percentage of the total of first admissions to all public mental hospitals in the state constituted by patients 65 years of age or older. This procedure served to reduce the error resulting from the different usage of or levels of mental hospital services available in these states (6). The states were then ranked, from highest to lowest, according to the percentage of first admissions of the aged and correlated with the three factors under consideration.

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FINDINGS

Age of Population and First Admissions of Aged Patients. The first correlation examined was that between the percentage of first admission of patients 65 and over and the percentage of total population in the state in the same age group. The hypothesis being examined here is that those states having a relatively old population will also tend to have a high proportion of aged first admissions to mental hospitals. Table 1 indicates the list of fourteen states that constitutes the Model Reporting Area, ranked according to percentage of first admissions 65 and older and percentage of the total population in the state in the same age category. These two factors were then correlated, yielding a Spearman's rank correlation coefficient of .09. This coefficient does not suggest a significant relationship. It appears that the age composition of the fourteen states has a negligible influence on the percentage of first admissions of the aged population.

Rural-Urban Residence and First Admissions of Aged Patients. The second relationship examined was that between the percentage of first admissions of the aged and proportion of urban dwellers in the particular state. Previous studies show that urban areas are over-represented in all age categories of the first admission rates to mental hospitals (4). However, in all of these studies the problem arises of the pos-

TABLE 1

Relationship Between Percentage of First Admissions of Aged to Public Mental Hospitals (1953) and Percentage of Aged in the Population (1950)

State*	Rank; based on percentage of first admissions of persons 65 and over	Rank; based on percentage of total population 65 and over
New York	1†	8
New Jersey	2	9
Pennsylvania	3	7
Illinois	4	4
Michigan	5	11
Ohio	6	6
Virginia	7	13
Kansas	8	2
Nebraska	9	1
Arkansas	10	5
Texas	11	12
California	12	10
Wisconsin	13	3
Louisiana	14	14

Spearman's Rank Correlation Coefficient: .09.

* Although Massachusetts was included in Model Reporting Area, it was not included in the correlation series because comparable statistics were not available.

† States are ranked from the highest (#1) to the lowest (#14).

sible distorting effects of the availability of services in rural *vs.* urban areas. This problem is avoided in our data, since we are using percentages of the total first admissions, rather than rates of admissions. Table 2 lists the fourteen states arranged according to their ranks on the two variables under consideration here. Correlating these variables by the same method used in Table 1, we obtain a Spearman's rank correlation coefficient of .56. Although this is not a very significant correlation, it does indicate that the rural-urban residence pattern exerts a far greater influence on first admissions of the aged than does the proportion of the aged in the total population of the state. An examination of Table 2 shows that the state having the greatest discrepancy between the ranks of the two variables was California. If this state were excluded from our calculations, the correlation coefficient would be considerably larger. Although we are not able to explain the discrepancy in the rankings for California, it may be that the state attracts many older people in the middle and upper income brackets who come there to retire. Individuals in this economic class tend to be under-represented in the mental hospital population (2). In order to determine whether a high percentage of patients in California was going to private mental hospitals, we added together the figures for patients in both public and private hospitals in the state. Adding the latter category made no difference in our final results.

Occupational Structure and First Admissions of Aged Patients. The final relationship to be explored was that existing between the occupational structure of the population in the state and the per cent of aged in the first admission statistics. For our purposes, occupational structure was determined by the relative distribution of the employed population in the state in the fol-

TABLE 2

*Relationship Between Percentage of First Admissions of Aged to Public Mental Hospitals (1953) and Percentage of Persons in the State Residing in Urban Communities (1950)**

State	Rank; based on percentage of first admissions of persons 65 and over	Rank; based on percentage of population residing in urban communities
New York	1	2
New Jersey	2	1
Pennsylvania	3	6
Illinois	4	4
Michigan	5	5
Ohio	6	7
Virginia	7	12
Kansas	8	11
Nebraska	9	13
Arkansas	10	14
Texas	11	8
California	12	3
Wisconsin	13	9
Louisiana	14	10

Spearman's Rank Correlation Coefficient: .56.

* Per cent of population dwelling in urban communities for the fourteen states, based on figures of the Department of Commerce, Bureau of the Census: *U. S. Census of Population*, Vol. II, Part 1, 1950.

lowing four categories: private wage and salary workers, government workers, self-employed workers, and unpaid family workers (5). For each state the number of persons in the first two divisions were summed and calculated as a percentage of the total employed population of the state. The fourteen states were then ranked according to the per cent of the total labor force constituted by private wage and salary workers and government workers. These categories seemed particularly pertinent to our investigation, since such workers tend to have a much more abrupt retirement experience than the self-employed or unpaid family workers. The latter include, for the most part, farm workers, small business owners, service workers, and self-employed professionals. Assuming that an abrupt retirement experience is stress-provoking and pathogenic, it is hypothesized that the per cent of the total labor force in the state employed as private wage and salary workers and government workers should be positively correlated with first admissions among the aged. Table 3 indicates that there does exist a strong relationship between the two variables being considered. The extent of this relationship was indicated by a Spearman's rank correlation coefficient of .74. Although this is by no means a conclusive observation, it does point to the desirability of further research along these lines.

TABLE 3

Relationship Between Percentage of First Admissions of Aged to Public Mental Hospitals (1953) and the Per Cent of the State Labor Force Employed as Private Wage and Salary Workers, and Government Workers (1950)

State	Rank; based on percentage of first admissions of persons 65 and over	Rank; based on per cent of labor force employed as private wage and salary workers and government workers
New York	1	3
New Jersey	2	2
Pennsylvania	3	1
Illinois	4	6
Michigan	5	5
Ohio	6	4
Virginia	7	8
Kansas	8	14
Nebraska	9	13
Arkansas	10	12
Texas	11	9
California	12	7
Wisconsin	13	11
Louisiana	14	10

Spearman's Rank Correlation Coefficient: .74.

DISCUSSION

In trying to determine the relative importance of three factors in influencing statistics on first admissions of persons 65 and over to public mental hospitals, it was found that occupational structure and rural-urban residence patterns seemed more important than age composition of the state. Although this information may provide some interesting speculations, it tells us little about their relative influence on the true incidence of mental disorder in the fourteen states under consideration. In addition, we cannot be certain if the relationship is actually due to the factors under consideration or to the fact that these were closely linked to others of which we are not aware. For example, are we to explain the urban-rural differences by a difference in the family structures in such areas that permits the senile aged to be contained in the rural environment and not in the urban? Or are we to assume that persons living in the two types of environment are subject to different levels of pathogenic stress? Many other hypotheses could be advanced. Only studies dealing with the true incidence of mental disorder in a given population and the mechanics underlying its genesis will give us definitive answers to these problems.[2] Furthermore, research attempting to evaluate the role of sociocultural factors in the etiology of mental

[2] The results of research conducted along these lines will soon appear in the publications of the Stirling County Project, under the direction of Dr. Alexander. H. Leighton of Cornell University.

disorder cannot afford to make the facile assumption of genetic homogeneity in the populations being compared. The work of Kallman on the genetics of schizophrenia (3) makes it imperative to compare relatively similar genetic samples before making definitive statements about the influence of environmental factors. These problems of further refinement of the voluminous data available on the distribution of mental disorder lie at the frontier of epidemiological studies.

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BOOK REVIEWS

HOFF, HANS, EDITOR. *Lehrbuch der Psychiatrie (2 volumes)*. Benno Schwabe & Co. Verlag, Basel, Switzerland, 1956. xv + 533 pp. illus.

This textbook of psychiatry presents part of a series on "Psychohygiene, Wissenschaft und Praxis" (mental hygiene, its scientific foundations and practice) as it is being published under the leadership of Heinrich Meng. Hoff, the editor of the two volumes under consideration, is Head of the Psychiatric and Neurological Clinic at the University of Vienna, an academic position richly endowed with tradition and for more than half a century a focal point of psychiatric cross currents in Europe. His collaborators in this book are Swiss psychiatrists of varying orientations and Hugo Krayenbühl, the well known Professor of Neurosurgery at the University of Zurich.

Throughout his own presentations, which constitute major portions of the text, Professor Hoff has endeavored to adhere to the multidimensional concept of psychiatry as it is now accepted and practiced here and abroad. The fact that he can write with authority on subjects like the history of psychiatry, depth psychology, physical therapies and child guidance speaks for his wealth of information as well as his ability to reconcile seemingly opposite points of view and approaches. It also may reflect a lifetime experience of an academic teacher, clinician and administrator in prominent position.

In reading chapter after chapter one is impressed by succinctness, empirical pragmatism and research mindedness. Basically Hoff's orientation is steeped in Kraepelinian nosology, yet supplemented by dynamic interpretations sufficiently liberal to accept at least descriptively the various schools of psychology as they have been elaborated in contemporary psychiatry. Moreover, a predominantly clinical approach succeeds in giving the volumes a form of unity not otherwise offered of late in international literature.

It is difficult to single out chapters of particular pertinence. This reviewer remains most impressed by Hoff's dissertation on epilepsy, Brun's contribution on neuroses and the therapeutic papers of Meng and Benedetti. It might be added that the second volume also contains detailed descriptions and discussion of psychosurgery and ends with two chapters concerning legal implications of psychiatric illness. In general, the references are ample and imply that the authors are keenly aware of research trends beyond the confines of their own countries. If one would want to search for omissions one might mention the scant representation of the theory of interpersonal relationships as a process precipitant in emotional disease. However, such a deficit may well be an intended one in view of the often contradictory application of this concept by psychotherapeutically oriented psychiatrists. In this connection one is reminded of Iago Galdston's observation that at the present stage of development no "international" psychiatry exists and it is therefore perhaps comprehensible that sociological and anthropological considerations in these volumes are touched upon rather by the clinically oriented authors themselves than presented by specialists in these fields. This may make such parameters more accessible to the medical student for whom this text seems to be primarily intended. Like many a European textbook, these volumes are written in lecture form which makes for considerable liveliness, and certain stylistic and idiomatic divergencies as they exist between the German spoken in Austria and Switzerland enhance the impression of individuality and directness. For those who are interested in an introduction into contemporary psychiatric thought in

Europe, the volumes are highly recommended.

Klaus W. Berblinger

CORSINI, RAYMOND J. *Methods of Group Psychotherapy*. McGraw-Hill, New York, 1957. xi + 251 pp. $6.50.

The author of this book combines in one person a perceptive, resourceful group therapist with widely varied experience and an indefatigable abstractor of the literature. In this book he manifests both his talents.

One of the major reasons for writing the book, the author states, was to indicate the complexity of the field and to counteract the tendency of enthusiasts of one particular procedure. To this end, about sixty per cent of it consists of brief abstracts of group therapy literature, organized under nine headings. The massive bibliography of over four hundred titles represents only about a fourth of the material published on group therapy since 1945, so that the author must have had some principle of selection but it is not apparent what this was. If the book has a fault, it is that it is too impartial. Viewpoints and methods of different authors, briefly abstracted, are strung together like beads, so that the reader without experience in this field is left with very little guidance as to what is significant and what is not. The problem is aggravated by the author's fondness for lists of brief quotations or one-line summaries. His strictly empirical approach comes off least successfully when used to derive a theory of group therapy by factor analyzing three hundred articles in the literature which contained mention of about one hundred and sixty-six mechanisms. The product is a formulation which is inclusive without being coherent. The method is most useful as a means of presenting applications and methods of group therapy. The brief, impartial descriptions can be a rich source of ideas for anyone wishing to experiment with this form of treatment.

On the rare occasions when the author allows his own opinions to obtrude, they are eminently sound, so one cannot help but regret that he did not permit himself to be more of the critic and less of the therapist in his approach to the published writings of his colleagues.

The style of the book is clear, unassuming, and enlivened by occasional flashes of kindly humor. It shows to best advantage in the final section which consists of edited brief examples of analytical group therapy, non-directive group therapy, family counseling, and psychodramatic group therapy. The examples are vivid and interesting and admirably convey the flavor of the different approaches, though some practitioners of each may feel that they have been slightly caricatured. Beginners and experts alike can derive much pleasure and profit from them.

The bibliographical section is too condensed and cluttered to be of much value to the novice, but is an excellent reference source for those who wish to delve into various aspects of group therapy.

Jerome D. Frank

WEBBER, IRVING L., EDITOR. *Aging: A Current Appraisal*. University of Florida Press, Gainesville, 1956. xi + 179 pp. $2.50.

WEBBER, IRVING L., EDITOR. *Services for the Aging*. University of Florida Press, Gainesville, 1957. xx + 159 pp. $2.50.

These two volumes, edited by Dr. Webber, are the sixth and seventh in a series reporting the proceedings of the annual Southern Conference on Gerontology held at the University of Florida each year since 1952 under the sponsorship of the Florida Institute of Gerontology. Each volume consists of chapters written by different authors and, hence, varies considerably in accuracy and style.

Aging: A Current Appraisal attempts to re-survey aspects of aging considered in the first conference in 1952. Readers who expect

to find a progress report of what has happened in basic research on aging since 1952 are doomed to disappointment. Although some of the chapters present the results of recent findings, those dealing with physiology, biology and medical care offer little that is new. In fact, some of the chapters are superficial and misleading due to hasty coverage of the literature. Chapters dealing with the social sciences and action programs offer a better picture of progress and are worthy of attention. Of particular interest are the chapters on demography of the aged, wage-price movements and old age security, and housing for the aged.

The second volume, *Services for the Aging*, offers useful descriptions of specific action programs. The central theme of the volume is emphasis on approaching the needs of older people as individuals, and the necessity of establishing the concept that old people have the right to be old in our society. "Old age must not be regarded as a state that we all try to evade and which we pretend is not going to happen to us, but something we can accept as one further experience along the road we have traveled throughout our lifetime". In this context, specific chapters deal with public welfare, health, home care, physical therapy, employment counseling, personal-social counseling, recreational and educational services for the aged. This volume is worthy of the attention of anyone who must deal with the practical daily problems of old people.

N. W. Shock

COBB, STANLEY. *Foundations of Neuropsychiatry*, 6th ed. The Williams and Wilkins Co., Baltimore, 1958. ix + 313 pp., illus. $5.00.

This is the sixth edition of a small but extremely well known volume. As initially stated by its author, "The book is a preface, to start the student with a three dimensional orientation towards neurology and psychiatry—a brief concurrent anatomy, physiology and pathology leading up to a description of some of the principal disease entities".

This most recent edition was made necessary by the developments of the last five years. At the time of publication of the fifth edition in 1952, nothing much was said about feed-back or the central modification of sensory perception in the physiology of reflexes. Neurochemistry had not been recognized as the major field it is. New passages also deal with recent work on the brainstem and with pain and reactions to it.

It is unfortunate that the author's breadth of knowledge, understanding and experience are not always reflected in the book. Too frequently important areas are neglected or passed over so lightly that this oversimplification involved is somewhat breathtaking. Perhaps it would have been wiser to change the name of the volume to something indicating more nearly what it is; namely, discussions of specific areas of interest to the author along with some reflections and "philosophy" resulting from his many years of thoughtful consideration of the problems of 'neuropsychiatry'. Its greatest value will be to introduce students to the importance of the psychological aspects of medicine.

R. G. Grenell

PENFIELD, WILDER, ET AL. *Clinical Neurosurgery*, vol. 4. (Proceedings of the Congress of Neurological Surgeons.) The Williams and Wilkins Co., Baltimore, 1957. xi + 142 pp., illus. $7.00.

This book is a compilation of eight papers presented at the Sixth Annual Meeting of the Congress of Neurological Surgeons. Although much of this material has appeared elsewhere this selection of papers by recognized authorities results in a very useful volume. Dr. Wilder Penfield as the honored guest contributes two chapters. The first of these is an absorbing account of his visit to the island of Cos and the Cnidian peninsula and is concluded with reflections on classical Greek medicine. His

second chapter is concerned with the function of perception and its localization within the temporal lobe. Four chapters are devoted to the diagnosis and treatment of pituitary adenomas; two to surgical and physiological aspects of Hypophysectomy. The edited discussion of these papers constitutes almost one fifth of the book and adds greatly to its value. The reviewer found the discussion of Dr. Gilbert Horrax's chapter on the surgical and irradiation treatment of pituitary adenomas to be particularly stimulating and to well express the controversial nature of such treatments. This book is well organized; it should be of service to all neurosurgeons and particularly those in trainee status.

J. D. McQueen

RICHTER, DEREK, EDITOR. *Metabolism of the Nervous System.* The Pergamon Press, New York, 1957. xiv + 599 pp. $16.50.

This volume contains the proceedings of the Second International Neurochemical Symposium held at Aarkus, Denmark in July 1956. The organization of the program was such that invited interviews on selected topics were supplemented by short papers on recent work or of special interest and the whole submitted to critical discussion.

The contributions deal with metabolism of adult nervous tissues, and cover an extremely broad range including molecular structure and morphology, chemical composition and cytochemical localization, permeability, electrolytes and nervous conduction, metabolism of ganglion and of brain and brain tissue (in vivo and in vitro), energy metabolism, metabolism of lipid, nucleic acid and protein and short sections on transmission and certain pharmacologically active substances. Obviously this was a most ambitious meeting, and from the results presented in this volume a most successful one. Recent advances discussed range from electron microscopy to drug action, with obvious appreciation of the growing significance of biochemistry in relation to the structure and function of the nervous system.

This is no superficial presentation organized and carried out (as seems to be more and more prevalent) to publicize any private group, company or product. Nor is its intent distorted by any unreal feeling on the part of the outstanding contributors that they wish to or can explain or cure mental illness. It is the report of sound scholars and investigators, interested in the study of the nervous system in health and disease, but convinced that the only real approach to any real clarification of the basic problems is through a continuing study of basic chemistry and physiology.

To anyone interested in nerve cells and nerve tissues and in understanding their role in the total picture of the organism this book is essential. All those associated with the Symposium, its organization and publication are to be congratulated.

R. G. Grenell

PODOLSKY, EDWARD, EDITOR. *The Neuroses and Their Treatment.* Philosophical Library, New York, 1958. xiv + 555 pp. $10.00.

This volume is a collection of forty papers of varying importance and excellence, in most instances previously published in reputable journals, and constituting according to the jacket blurb, a "comprehensive survey of the field at present." It covers a range of topics from psychotherapy in infancy to electrocoagulation of the ventromedial quadrant of the prefrontal lobe "for the relief of neurotic suffering." Such a collection, however commendable the individual offerings, or the motives of the anthologist, raises inevitable questions about its possible usefulness. Its range is so broad, even within the confines of "the neuroses," and its samplings so necessarily restricted, that it will hardly be able to serve either the serious student or the dilettante. The former will, himself, track down the papers which he considers relevant to his problem.

The latter is apt to be overwhelmed by increasing confusion, or by paralysis at the prospect of having to assimilate and digest the contents of such a fat volume.

Certainly, anthologies have a function and new books are often a joy to read. Collections of this variety, however, may remind one of the plaint of James Russell Lowell:

"For reading new books is like eating new bread,
One can bear it at first, but by gradual steps he
Is brought to death's door of a mental dyspepsy."

Let us adopt a prudent caution when considering future issues of global anthologies of already published articles. Our field is less in need of aggregates than of syntheses.

Eugene B. Brody

MOLONEY, JAMES C. *Fear: Contagion and Conquest.* Philosophical Library, New York, 1957. xii + 140 pp. $3.75

Dr. Moloney summarizes his book by saying "...I profoundly believe that fear and tension are contagious, *i.e.*, they can be transmitted by even a healthy mother to her offspring. Mothers in a healthy culture can produce healthy children, but these same healthy mothers, when placed in an unhealthy culture or a culture foreign to them, will more often than not produce unhealthy children...." The author amplifies this point of view with a variety of anthropological illustrations. He compares native Chinese with the Chinese in America, native Okinawans with Okinawans in Hawaii, and Israeli Jews with American Jews to illustrate the noxious effects of foreign culture. The Japanese way of life is singled out as a particularly bad example of an unhealthy culture.

Dr. Moloney states that "The child is not born with destructive drives" but these develop only as reactions to frustration. Sources of frustration are diffuse and varied. Dr. Moloney attacks these sources of frustration with vigorous polemic and illustrates the attenuation of neurotic symptoms in the children of immigrant Israeli mothers as evidence that the situation is reversible.

The author shows some very strong feelings about this subject. In the course of his writing, he elevates many interesting speculations to the status of universally accepted fact. This is a serious defect unless the reader is technically sophisticated.

E. Callaway, III.

GRIES, ULRICH. *Abbau der Persönlichkeit.* Ernst Reinhardt Verlag, Munich, 1957. 176 pp. $2.10

The author, who has been a prisoner of war in Russia, presents a study concerned with personality changes during "dystrophy." By dystrophy is meant hunger dystrophy as it occurs under conditions of extreme nutritional deprivation. That such deprivation could be observed more readily during enforced detention, as in concentration and prisoner of war camps may present an artifact, especially in a psychological study. At any event, his observations and his follow-up studies after the prisoners had returned home are, though clinical in scope, executed according to a carefully planned methodological design. These are described at considerable length, and pertinent data and questionnaires are appended at the end of the treatise. Hunger dystrophy, up to the time of this study, was predominantly considered and examined from a physiological point of view. To this now, Gries adds psychological dimensions which he summarizes as "Abbau der Persönlichkeit." For want of a better translation, one might interpret his title as "demolition or a dismantling" of personality, though perhaps the best analogy would be to name it "psychologic catabolism." By and large, the author describes a general psychopathology as it develops during increasing deprivation and malnutrition; which amounts to a narrowing of

perceptual and communicative functions, inability to deal with complexities and increasing predominance on one single drive at the expense of other previously integrated instinctual needs. At the height of the dystrophic state, the drive for food seems to assume proportions that all libidinal goals seem to be subordinated to what one might call aggressive orality. It is, for instance, described in considerable detail how such states completely obliterate previously existing sexual needs, *e.g.*, possibility of contact with women is anticipated merely in terms of what this person would be able to cook. In line with such emotional experience and anticipation an extreme narrowing of the field of drive and goal direction can be demonstrated in fantasy and action. Numerous examples of total and individual mental functions are given and interpreted in the light of psychopathological concepts and theories. These concepts and theories range from a descriptive psychiatric approach to interpretation in the light of depth psychology and existentialism and are introduced by an informed and thoughtful preface of Doctor C. Fervers'.

Considering the relative paucity of psychologic evaluations concerned with food deprivation, Doctor Gries' careful analysis of his own and the reactions of others under deprivational stress must be considered an interesting contribution to psychological literature.

Klaus W. Berblinger

ERRATUM

In the article by T. E. Weckowicz and R. Hall, in Volume 126, Number 5, May 1958, the legend for Figure 1 (page 419) should read as follows:

Fig. 1. Differences in skin reaction to histamine; schizophrenics and non-schizophrenics. Abscissa represents time in minutes; ordinate represents size of wheal in millimeters. *Upper curve represents non-schizophrenics; lower curve schizophrenics.*